RAD
data communications

Installation and Operation Manual

D8E1T1

8-Port E1/T1 Module

DXC-100 MODULE

D8E1T1

8-Port E1/T1 Module

Installation and Operation Manual

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Chapter 1
Overview

1.1 Introduction

Purpose

This manual describes the technical characteristics, application, installation, and operation of the D8E1T1 used in the DXC-100 Multiservice Access Node. D8E1T1 is an 8-port E1/T1 module that supports up to eight E1 or T1 links, in any combination, with D4 (SF), ESF or G.70x framing and AMI, B8ZS or HDB3 line coding. The module has integral BERT and supports loopback diagnostics.

10:1 hardware redundancy is available via the DXC-100PSX unit.

Main Features

D8E1T1 simultaneously terminates both DS1 (T1) and E1 and associated framing signals on the same card, providing a cost-effective method for performing A-law to μ-law conversion. D4 and ESF framing modes are supported for T1 links. CRC and CAS framing modes are supported for E1 links. N+1 redundancy is supported for critical links.

D8E1T1 has extensive statistic gathering capability. Each of the T1/E1 framers can report sync status, frame errors, CRC errors, frame slips, and several link alarm conditions. Diagnostics include integral BERT and loopback diagnostics for in-network testing. For voice applications, call processing ABCD signaling bits can be monitored.

Software Updates

For software update procedures, refer to the *Utilities* chapter of the *DXC-100 Installation and Operation Manual*.

1.2 Physical Description

D8E1T1 Module Set, General

D8E1T1 occupies a single backplane slot in the DXC-100 chassis. The D8E1T1 module set has two circuit card modules: an application module and an interface module. The application module (front card) contains the backplane, switching, and framing logic. The interface module (rear card) provides electrical interface via a 50-pin RJ-48M (50-Pin telco) connector.

Thumbscrews at the top and bottom of the panels secure the modules in the chassis and make electrical connection to frame ground for regulatory emission compliance. The electrical connection to frame ground also protects the modules from static discharge. Top and bottom card ejectors on the application module facilitate its removal (and insertion).

Application Module

Front Panel

The D8E1T1 application module occupies one application module slot in the DXC-100 chassis. The panel of the D8E1T1 application module is shown in *Figure 1-1*. The module panel includes eight groups of status indicators (one group for each link), and a common READY indicator. *Table 1-1* explains the functions of the indicators located on the module panel.

Table 1-1. D8E1T1 Module Indicators

Indicator	State	Description
STATUS	Green	Link is operational and functioning properly. The link is free of Framing Errors, and there are no alarms.
	Red	A Link Fault or alarm condition exists, such as Yellow Alarm, AIS, LOF, etc.
	OFF	The link is configured as Out of Service.
TEST	Yellow	The T1/E1 link is in a loopback condition, or link BERT is enabled.
	Flashing Yellow	An error has been detected during T1/E1 link BERT.
	OFF	No testing is being conducted.
READY	Green	Module is fully operational and in an online state.
	Flashing Green	Module is fully operational, and in a standby state (when N+1 redundancy has been implemented).
	Red	Module is in a system bus error state.
	Flashing Red	Module is in offline (fault) state
	OFF	Module is not powered up.

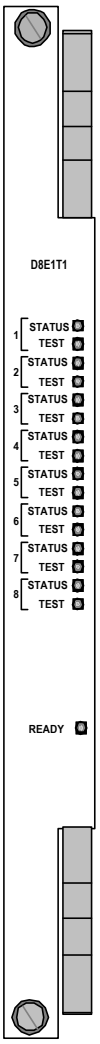

Figure 1-1. D8E1T1 Module Panel

Other LED Indications

When all front panel LEDs are cascade lighting from top to bottom, the module is downloading software to memory.

Caution Do not interrupt the software upgrade while it is in progress, otherwise the D8E1T1 module configuration may be damaged. In the event of damage, please contact RAD Technical Support Department.

If all front panel LEDs are off except the READY LED, it indicates that all links are Out of Service.

If all LEDs are flashing, it indicates that the rear interface module is missing or the device is being forced Out of Service.

Interface Module Panel

The interface connector of D8E1T1 is located on the interface module that plugs into a separate compartment in the rear of the DXC-100 chassis.

Figure 1-2 shows the panel of the D8E1T1 interface module. The interface module has one RJ-48M connector that includes all the link interfaces.

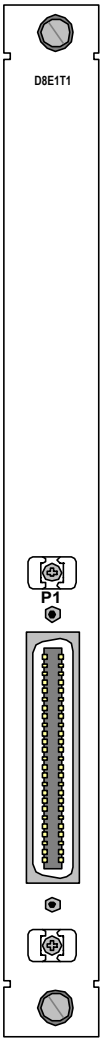

Figure 1-2. D8E1T1 Interface Module Panel

1.3 D8E1T1 Module Specifications

Number of Ports		Eight
	Data Rate per Port	E1 – 2.048 Mbps T1 – 1.544 Mbps
	Electrical Interface	ITU-T Rec. G.703
	Framing	• CRC • CAS • SF (D4) • ESF
	Line Code	E1 – HDB3 T1 – AMI, B8ZS
	Jitter Performance	Per ITU-T Rec. G.823; ETSI TBR 13
	Pulse Shape	Per ITU-T Rec. G.703
Connector		50-pin RJ-48M connector on the rear interface module, convertible to eight RJ-45 connectors via an adaptor cable
Timing		• Receive timing recovered from incoming line signal or received via the DSMC.2 module • Transmit timing locked to the DXC-100 master (Stratum 3) clock
Redundancy Capability		Up to 10:1 when used with in a DXC-100 nest configured with the DXC-100PSX N+1 Protection Switch
Indicators		• READY (green/red): indicates the status of the module set in general • STATUS (red/green): indicates link status separately for each of the E1/T1 links. • TEST (yellow) indicates test status separately for each of the E1/T1 links.
Timeslot Allocation		• User-defined, any timeslot to any timeslot mapping
Diagnostics		• Local and remote loopbacks on each module port • BER testing on each port • Inband code activated loopback as per ANSI T1E1.2/93-003

Power Consumption		7.25W (1.45A at +5 VDC)
Configuration		Programmable via DXC-100 management by ASCII terminal, Telnet or RADview Management System
Physical	*Front Main Module*	
	Height	263 mm (10.3 in)
	Width	25 mm (9.8 in)
	Depth	213 mm (83.8 in)
	Rear Interface Module	
	Height	263 mm (10.3 in)
	Width	25 mm (9.8 in)
	Depth	127 mm (50.0 in)

Chapter 2
Installation and Operation

2.1 Introduction

This chapter provides installation, configuration, and operation instructions for the D8E1T1 module.

The information presented in this chapter supplements the DXC-100 installation, configuration and operation instructions found in the *DXC-100 Installation and Operation Manual*.

Warning

Before performing any internal settings, adjustment, maintenance, or repairs, first disconnect all the cables from the module, and then remove the module from the DXC-100 chassis.
There are no internal settings, adjustments, maintenance, or repairs for either the operator or the user to make. These activities are performed only by a skilled technician who is aware of the hazards involved.
Always observe standard safety precautions during installation, operation, and maintenance of this product.

ESD Caution

The D8E1T1 module components are sensitive to electrostatic discharge. To prevent ESD damage, always hold the module by its sides, and do not touch the module components or connectors. When handling this module, wear an anti-static wrist strap connected to frame ground to prevent electrostatic discharge from damaging the circuits.

2.2 Installing D8E1T1

Note *To use N+1 redundancy, D8E1T1 must be installed in slots 2 to 10, with a redundant module installed in slot 1 (for Narrowband Group 1).*

Application Module Installation

1. Hold the application module vertically with the components on the left.
2. Slide the application module into a slot in the front of the DXC-100 chassis following the white card guides.
3. Open both card ejectors until they are at a 90-degree angle to the module, then slide the module further into the slot until the hook on the card ejectors is inside the lip of the DXC-100 chassis.
4. Slowly close the card ejectors, which seats the application module in the slot.
5. Tighten the thumbscrews at the top and bottom of the application module.

Interface Module Installation

1. Hold the interface module vertically with the components on the right.
2. Slide the interface module into a slot in the rear of the DXC-100 chassis following the white card guides.
3. Seat the interface module by slowly pressing it into place.
4. Tighten the thumbscrews at the top and bottom of the interface module.

2.3 Connecting the Cables

Link Connection Data

The D8E1T1 interface module has a 50-pin RJ48M connector designated P1. *Table 2-1* lists the connection pin functions.

Straight cable CBL-DXC100-D8E1T1/BAL, or cross-cable CBL-DXC100-D8E1T1/BAL/X, terminated in 8 RJ-45 connectors, can be ordered from RAD.

Table 2-1. 50-Pin Connector P1, Pin Functions

Link	Pin	Function	Link	Pin	Function
1	26	Transmit tip	5	38	Transmit tip
	1	Transmit ring		13	Transmit ring
	27	Receive tip		39	Receive tip
	2	Receive ring		14	Receive ring
2	29	Transmit tip	6	41	Transmit tip
	4	Transmit ring		16	Transmit ring
	30	Receive tip		42	Receive tip
	5	Receive ring		17	Receive ring
3	32	Transmit tip	7	44	Transmit tip
	7	Transmit ring		19	Transmit ring
	33	Receive tip		45	Receive tip
	8	Receive ring		20	Receive ring
4	35	Transmit tip	8	47	Transmit tip
	10	Transmit ring		22	Transmit ring
	36	Receive tip		48	Receive tip
	11	Receive ring		23	Receive ring

Connection Instructions

Before starting, refer to the installation plan to determine the cables intended for connection to the D8E1T1 module.

- Connect the standard interface cable (CBL-DXC100-D8E1T1/BAL, or cross-cable CBL-DXC100-D8E1T1/BAL/X, or equivalent) to connector P1 on the panel of the interface module and each RJ-45 connector to the user's equipment.
- When the optional N+1 redundancy function is implemented, connect a CBL-100PSX-D8E1T1 cable from connector P1 of the module to the corresponding PSX interface module.

A single screw is used to attach one end of the RJ-48M plug to the module connector standoffs on the rear interface module.

In order to securely fasten the opposite end of the plug, cable tie mounts have been provided on the rear interface module. These mounts are located above and below the RJ-48M connector so that tie-wraps (provided) can be used to securely hold the plug in the connector:

- The cable tie mount above the connector is used to attach a tie-wrap around an interface cable (CBL-100PSX-D8E1T1) that feeds down from the DXC-100PSX N+1 Protection Switch.

- Use the cable tie mount below the connector to attach a tie-wrap around a standard interface cable, such as CBL-DXC100-D8E1T1/BAL, that feeds from below the DXC-100.

Refer to *Figure 2-1* for a detailed view of tie-wrap attachment locations.

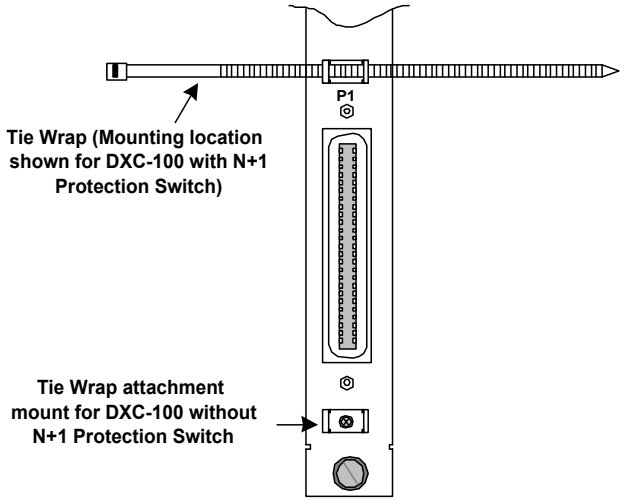
P1
Tie Wrap (Mounting location shown for DXC-100 with N+1 Protection Switch)
Tie Wrap attachment mount for DXC-100 without N+1 Protection Switch

Figure 2-1. Tie-Wrap Attachment Locations

2.4 Normal Indications

D8E1T1 Status Indication

When a D8E1T1 module is operational, its READY indicator lights in green.

For a module in the standby state (N+1 redundancy implemented), the READY indicator flashes in green.

Link Status Indications

The status of each D8E1T1 link is indicated by a separate set of indicators. The normal indications for an operational link interface are as follows:

- The STATUS indicator of an active link lights in green.
- The TEST indicator is off. It lights in yellow when a BER test or loop is activated on the corresponding link.

Chapter 3
Configuration

3.1 Introduction

This chapter provides specific configuration information for D8E1T1 modules. The configuration activities are performed by means of the management system used to control the DXC-100.

Note *All the menus identify the D8E1T1 module as **Octal T1/E1** or **OT1E1**.*

This chapter covers only the configuration activities specific to D8E1T1 modules: for general instructions and additional configuration procedures, refer to the *DXC-100 Installation and Operation Manual*.

3.2 Configure a Slot for a D8E1T1 Module

Note *In order to view the menus associated with the D8E1T1 module set, a slot must be configured for the D8E1T1 module set, and a D8E1T1 Application Module must be resident in the corresponding front slot in the DXC-100 equipment nest.*
A D8E1T1 Interface Module must also be resident in the corresponding rear slot in the nest. If the slot does not show a "Configured Type" in the Slot Summary Menu, refer to the text below for information on how to configure a slot.

The following procedure describes how to assign and configure a slot for the D8E1T1 module set.

1. From the DXC-100 Main Menu, move your cursor to the System Configuration field and press **<Enter>**. The following menu appears:

```
                    Node Configuration Menu


                    Slot Configuration
                    Nest Profile
                    System Clock Source Menu
                    Users Menu
                    Port IP Addresses
                    SNMP Agent Configuration
                    Date and Time
                    TACACS Plus
```

Figure 3-1. Node Configuration Menu

2. Place your cursor on the *Slot Configuration* field and press **<Enter>**. The following menu appears, displaying slots numbered from 1 to 11.

Note *For a DXC-100 stack, use the following sequence to reach the Slot Configuration Menu (Figure 3-2): System Configuration → Nest Profile → Move your cursor to the nest where the D8E1T1 module will reside → Press **S**.*

```
                Nest #1  Slot Configuration Menu

Slot#   Device Type          Name          Redundancy
-----   ----------------    ------        ------------
1       Octal T1/E1                        Disable
2       Octal T1/E1                        Disable
3       Octal T1/E1                        Disable
4       Octal High Speed                   Disable
5       Octal High Speed                   Disable
6                                          Disable
7       HDS-3                              Disable
8       HDS-3                              Enable
9       T3                                 Disable
10      Octal T1-E1                        Disable
11      HDS-3                              Enable

N+1 Redundancy:              Enable
N+1 Redundancy Switchover:   Automatic
N+1 Redundancy Restore:      Manual

Change Card = [Enter key]   [D]elete Card  [P]ort/Link Cfg
```

Figure 3-2. Slot Configuration Menu

3. Move your cursor to the slot number where the D8E1T1 module will reside, and press **<Enter>**. The following menu appears:

```
                    Slot Configuration


                    Nest: 1
                    Slot: 10
                    Slot Name:
                    Card Type:
                    Redundancy: Disable
```

Figure 3-3. Slot Configuration Submenu

4. Place your cursor on the *Slot Name* field and press **<Enter>**. Type in a slot name or number of up to 11 alphanumeric characters and press **<Enter>** again.
5. Select a card type. Move your cursor to the *Card type* field and press **<Enter>**. The Card Type Menu appears:

```
                    Select a Card Type

  1) XCC             2) XLC              3) XLCOT1E1
  4) STM1            5) STM1X            6) OC3
  7) OC3X            8) STS1             9) HDS3
 10) DS3            11) E3              12) OT1E1
 13) QT1            14) OHSD            15) QHSD
 16) DS0-DP         17) OCU-DP          18) TAM
 19) ROUTER         20) OCTAL VOICE

                Enter Card Type Number: 0
```

Figure 3-4. Select a Card Type Menu

6. Press **<Enter>**, type in the number of the D8E1T1 module (12), then press **<Enter>** again to store the device type.
7. Press **X** to save module type and return to the Slot Configuration Submenu.
8. For DXC-100 units with the N+1 Protection Switch, move your cursor to the Redundancy field to Enable or Disable redundancy as desired.

Note *The Redundancy field will only be displayed if Narrowband Redundancy has been Enabled and set to D8E1T1 via the Nest Profile Menu. In order to utilize N+1 redundancy, a D8E1T1 module must be installed in one of the slots 2 to 10, with a redundant module installed in slot 1 (for Narrowband Group 1).*

9. Press **X** to save changes. When prompted: "`Update Configuration? Are you sure (Y/N)?`" Press **Y**. You are returned to the Slot Configuration menu.

Change a Module Set

1. Physically remove the module set from the DXC-100 unit.
2. Move your cursor to the slot where the module set resided, and press **D**. A message appears stating, "`All existing connections for this slot will be deleted.`" Press **Y** to confirm the action or **N** to cancel.

Note *If you do not remove the module set prior to pressing **D**, the following message appears: "`-ALERT!- Can not delete a device that is present`".*

3. Physically insert the new module set into the DXC-100 unit in accordance with *Chapter 2*.
4. Configure the slot for the new module set. Follow the steps in the previous procedure.

Note *A module set may also be changed without deleting the old module set by skipping step 2 of this procedure.*

3.3 D8E1T1 Module Configuration

This section will guide you through configuring the T1/E1 links for a D8E1T1 module.

Note *A module does not have to be physically present to be configured, but the slot must be configured for that type of module.*

T1/E1 Link Configuration

Navigation:		
Standalone DXC-100	**OR**	**DXC-100 Stack**
Main Menu ↓ System Configuration ↓ Slot Configuration ↓ Select Slot with D8E1T1 Module ↓ [**P**]ort/Link Cfg		Main Menu ↓ System Configuration ↓ Nests Profile ↓ Select Nest with D8E1T1 Module ↓ [**S**]lot Conf. ↓ Select Slot with D8E1T1 Module ↓ [**P**]ort/Link Cfg

```
                  Nest #1   Slot #10 Links Configuration

                                                          Network Yel   Idle
     Link Name           Framing            FDL  LH/LBO   Loop    Alarm Code
-- ------------------- ----------------- ------ ------- ------- ----- ----
01 Circuit Number     T1 ESF B8ZS        54016  0.0db   Disable  Yes  Busy
02 Circuit Number     T1 ESF AMI 62411   54016  0.0db   Disable  Yes  Busy
03 Circuit Number     T1 ESF AMI CLEAR   54016  0.0db   Disable  Yes  Busy
04 Circuit Number     T1 D4 B8ZS                0.0db   Disable  Yes  Busy
05 Circuit Number     E1                        S-Haul  Disable  Yes  Busy
06 Circuit Number     E1-CRC                    S-Haul  Disable  Yes  Busy
07 Circuit Number     E1-CAS                    S-Haul  Disable  Yes  Busy
08 Circuit Number     E1-CAS-CRC                S-Haul  Disable  Yes  Busy

LH - long haul LBO - line build out[T1 only] FDL - facility data link
[C]opy cfg to all
```

Figure 3-5. D8E1T1 Link Configuration Menu

1. To change parameters for an individual link, move the cursor to the link to be changed and press **<Enter>**. The following menu appears:

```
          Nest #1   Slot #10 Link Configuration

                Link Nbr......: 1

                Name..........: Circuit Number
                Status........: In Service
                Clear T1/E1...: Disabled
                LineType......: T1 ESF B8ZS
                Network Loop..: Disabled
                Tx Yel Alm/RAI: No
                Unused DSO's..: Busy
                ESF format....: 54016
                LBO...........: 0.0db <> Long Haul
                Recover Time..: 3 seconds
```

Figure 3-6. Individual Link Configuration Menu (T1 Example)

```
          Nest #1   Slot #10 Link Configuration


                  Link Nbr......: 8

                  Name.........: Circuit Number
                  Status.......: In Service
                  Clear T1/E1...: Disabled
                  LineType.....: E1-CAS-CRC
                  Network Loop..: Disabled
                  Tx Yel Alm/RAI: Yes
                  Unused DSO's..: Busy
                  Long Haul.....: S-Haul
```

Figure 3-7. Individual Link Configuration Menu (E1 Example)

Use the field descriptions in *Table 3-1* on the following pages to configure the links. Once changes are made to the appropriate fields, do the following:

2. Press **X** to save changes. When prompted: "`Update Configuration? Are you sure (Y/N)?`" Press **Y**. You are then returned to the Links Configuration Menu.
3. To configure another link, or when all links are configured, press **X** to return to the Node Summary Menu.

Note *For D8E1T1 and DT3 module sets, using the copy configuration (**[C]**opy cfg to all) feature will prompt a message that will delete connections based on line type changes (e.g., going from T1 to E1 or vice versa).*

Table 3-1. Individual Link Configuration Menu Field Descriptions

Field	Description
Link Nbr: (display field)	This field displays the Link Number (1-8) of the link that you are configuring.
Name: (text field)	This is a user-defined field. Any name up to 20 alphanumeric characters can be entered to identify each link on the D8E1T1 module. You may find it beneficial to use circuit numbers to name the links.
Status: (option field)	This field is used to select the state of the link. You can put the link • *In Service* or *Out of Service In Service* - The link is active. When the link is *In Service* you can run diagnostics. • *Out of Service* - The link is not in use. The Out of Service mode suppresses false alarms that would otherwise be generated by the absence of a received signal. Also, all receive and transmit path time slots in the link are set from *Busy* to *Idle*. You cannot run diagnostics when a link is *Out of Service*.

Table 3-1. Individual Link Configuration Menu Field Descriptions (Cont.)

Field	Description
Clear T1/E1: (option field)	"Clear" refers to a condition where the module passes data through without reformatting it in any way (essentially, the module acts the same as a wire). The following selections are available: • *Framed* - Framing is conveyed through the switch fabric. Allows alarms and statistics to be displayed. • *Unframed* - Full bandwidth of the frame is used for data. Passes data without keeping track of alarms and statistics. Limited diagnostics functions are available. • *Disabled* - Framing is terminated and regenerated. Turns off Clear mode (uses standard framing pattern and detects all alarms/errors). All diagnostic functions are available. ***Note*:** *When using Clear T1 (E1) mode, make the connection ensuring that 25 (32) DS0s have connections mapped. This is necessary because of the way Clear T1 mode operates, taking the framing bits from the first 24 (31) DS0s and sending them all out through the 25th (32nd) DS0. See the Connection Maps Chapter in the DXC-100 Installation and Operation Manual for details on connection mapping.*
LineType: (option field)	This field determines the type of framing used on the line. When Clear T1/E1 is set to Framed or Disabled, the available line types are as follows: • T1-ESF B8ZS • T1-ESF AMI 62411 • T1 D4 B8ZS • T1 D4 AMI 62411 • E1 • E1-CRC • E1-CAS • E1 CAS-CRC ***Note*:** *The Long Haul and Short Haul line interface options are available with E1 line types, and the LBO (Line Build Out) option field is available with T1 line types.* When Clear T1/E1 is set to Unframed, the available line types will be T1 AMI, T1 B8ZS, or E1.
Network Loop: (option field)	This parameter determines the D8E1T1 module's ability to respond to diagnostic commands received from the network supplier. Enabled indicates that the D8E1T1 Module will respond to loop commands received from the network supplier, and Disabled indicates that it will not respond. Selectable only in Clear T1/E1 Disabled mode.
Tx Yel Alm/RAI: (option field)	Yes causes the T1 or E1 circuit to discard data and send a yellow alarm (T1) or RAI (E1) if it is in a red alarm condition for the number of seconds selected in the Recover Time field. Yes must be chosen if the network supplier is a common carrier, such as a telephone company. Selectable only in Clear T1/E1 Disabled mode.

Table 3-1. Individual Link Configuration Menu Field Descriptions (Cont.)

Field	Description
Unused DS0's: (option field)	This entry is used to select the state of unused DS0s as either Busy or Idle. Selectable only in Clear T1/E1 Disabled mode. Idle - The hex value 7F (11111111) is sent. Busy - The hex value FF (11111111) is sent.
ESF Format: (option field)	This entry describes the types of T1 ESF network commands to which the D8E1T1 Module responds, and is not applicable to D4 networks. With ESF networks, this information must be obtained from the network supplier. Choose between 54016 (AT&T Technical Reference 54016) and T1.403 (ANSI specification T1.403). Selectable only in Clear T1/E1 Disabled mode.
LBO: (T1 option field)	This field sets the line attenuation level, and should be set to 0 dB (no attenuation) unless the network supplier specifically requests otherwise. 0.0 dB through 22.5 dB = long haul; 0-133 Ft. through 655 Ft. = short haul. The available settings are: • 0.0 dB <> Long Haul • 7.5 dB <> Long Haul • 15.0 dB <> Long Haul • 22.5 dB <> Long Haul • 0-133 Ft. <> Short Haul • 133-266 Ft. <> Short Haul • 266-399 Ft. <> Short Haul • 399-533 Ft. <> Short Haul • 533-655 Ft. <> Short Haul ***Note*:** *The LBO (Line Build Out) option field is available only with T1 line types.*
Long Haul: (E1 option field)	L-Haul (Long Haul) is the physical interface selection for long connection to E1 equipment, while S-Haul (Short Haul) is the physical interface selection for collocated E1 equipment. ***Note*:** *The Long Haul and Short Haul line interface options are available only with E1 line types. Long Haul/Short Haul designations for E1 are defined by authentication of signal presented to the receiving circuitry, not by cable length. Short Haul is defined as 0 to -6 dB, and Long Haul as 0 to -34 dB. This loss is related to cable type and cable length.*
Recover Time: (T1 option field)	This field is used to specify how quickly Red/Yellow alarms are cleared following the recovery of the given T1 facility (e.g., valid signal and framing present). Select either 3, 10, or 15 seconds. ***Note*:** *The Recover Time options field is available only with T1 line types.*

3.4 Accessing the D8E1T1 Main Menu

The D8E1T1 Main Menu allows you to view the configuration of the D8E1T1 module, run diagnostic tests, access utilities, view N+1 Redundancy status (DXC-100 units with N+1 Protection Switch), and display module identification (software and hardware revision levels). These procedures are detailed on the next several pages.

Note *The procedure for accessing the Main Menu for a particular module set will be different for the Standalone DXC-100 and stack versions. The Navigation Box below shows the two different methods used to get to the Nest Summary Menu, from which the module's Main Menu and all subordinate menus can be accessed.*

1. Use the appropriate method from the Navigation Box below to access the Nest Summary Menu.

Navigation:		
Standalone DXC-100	**OR**	**DXC-100 Stack**
Main Menu ↓ Nest Summary		Main Menu ↓ Node Summary ↓ Nests Profile ↓ Nest with D8E1T1 Module ↓ Nest Summary

Note *On the Nest Summary Menu, the Configured Type must display "Octal T1-E1" and the Device State must display "Online" or "Standby" in order to access the D8E1T1 Main Menu. If the Device State is "Offline", an alert message is generated.*

```
 Standby SMC not present                      N+1 Redundancy State: Frozen
Alarm Contacts..: Enabled                    Alarm Contact Type..: Standard

 Nest #1   Slot Summary Menu

 N+1
Slot#   Group   Configured Type   Device State         Alarm
-----   -----   ---------------   ------------         -----
01              ----              Not Present          None
02              Test Access       Online               None
03              ----              Not Present          None
04              Octal High Speed  Online               None
05              ----              Not Present          None
06              Router            Online               None
07              ----              Not Present          None
08              Hybrid DS-3       Online              *Critical
09              ----              Not Present          None
10              Octal T1-E1       Online              *Major
11              ----              Not Present          None
SMCA            System Manager A  Online               None
SMCB            System Manager B  Not Present          Critical
PSX             ProtectionSwitch  Not Present          None


[C]lear error counts   [T]oggle Alarm Contacts

N+1 Device Redundancy: Switch[O]ver   [R]estore   [E]xpose
```

Figure 3-8. Nest Summary Menu

2. Then place your cursor on the slot number where the D8E1T1 module is located and press **<Enter>**. The D8E1T1 Main Menu appears. See main menu structure in *Figure 3-10*.

```
                          Main Menu
                          ----------


                        View Configuration
                        Diagnostics
                        N+1 Redundancy
                        Utilities
                        About
```

Figure 3-9. D8E1T1 Main Menu

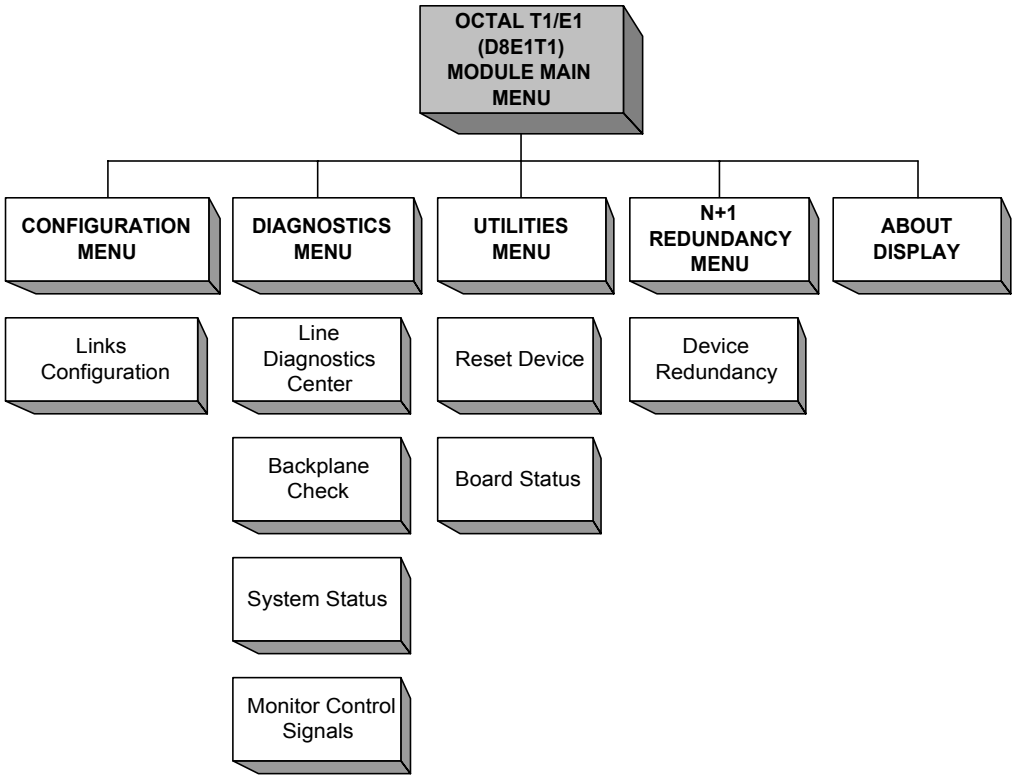

Figure 3-10. D8E1T1 Menu Structure

3.5 View Configuration Menu

The View Configuration Menu allows you to view the configuration of the eight T1 or E1 links. To actually configure the D8E1T1 module, refer back to the previous section *D8E1T1 Module Configuration*.

View T1/E1 Link Configuration

Navigation:
D8E1T1 Main Menu ↓ View Configuration

```
                          Links Configuration
                         ---------------------

                                                                Network  Yel    Idle
     Link Name              Framing          FDL    LH/LBO     Loop     Alarm  Code
-- -----------------    ---------------- ------  -------  -------  -----  ----
01 Circuit Number       T1 ESF B8ZS      54016  0.0db    Disable  No     Busy
02 Circuit Number       T1 ESF B8ZS      54016  0.0db    Enable   Yes    Busy
                   03 Circuit Number       Out Of Service
                   04 Circuit Number       Out Of Service
                   05 Circuit Number       Out Of Service
                   06 Circuit Number       Out Of Service
                   07 Circuit Number       Out Of Service
                   08 Circuit Number       Out Of Service

 LH - long haul    LBO - line build out[T1 only]    FDL - facility data link
```

Figure 3-11. D8E1T1 View Links Configuration Display

From here, you can view the status of the eight T1 or E1 Links.

View Individual Link Configuration

To view a more detailed status of an individual link, move the cursor to the link to be viewed and press **<Enter>**. The following display appears:

```
                      Link Configuration
                     --------------------


                  Link Nbr......: 1

                  Name..........: Circuit Number
                  Status........: In Service
                  Clear T1/E1...: Disabled
                  LineType......: T1 ESF B8ZS
                  Network Loop..: Disabled
                  Tx Yel Alm/RAI: No
                  Unused DSO's..: Busy
                  ESF format....: 54016
                  LBO...........: 0.0db <> Long Haul
                  Recover Time..: 3 seconds
```

Figure 3-12. View Individual T1/E1 Link Configuration Menu (T1 Example)

```
                    Link Configuration
                   --------------------


                  Link Nbr......: 8

                  Name.........: Circuit Number
                  Status.......: In Service
                  Clear T1/E1...: Disabled
                  LineType.....: E1-CAS-CRC
                  Network Loop..: Disabled
                  Tx Yel Alm/RAI: Yes
                  Unused DSO's..: Busy
                  Long Haul.....: S-Haul
```

Figure 3-13. View Individual T1/E1 Link Configuration Menu (E1 Example)

From here, you can view the configuration of one link at a time. Refer back to *Table 3-1* for an explanation of the fields in this menu.

3.6 N+1 Redundancy Menu

The N+1 Redundancy Menu allows you to view N+1 Redundancy Status. It is applicable to DXC-100 units equipped with the DXC-100 PSX Protection Switch. For specific information and instructions on setting up a D8E1T1 module set in a redundancy group, refer to the *DXC-100 Installation and Operation Manual*.

Note *If you have only one D8E1T1 module set installed in your DXC-100, Redundancy must be set to "Disabled".*

Navigation:
D8E1T1 Main Menu ↓ N+1 Redundancy

```
                    N+1 Redundancy Menu
                   ---------------------
                     Device Redundancy
```

Figure 3-14. D8E1T1 Module N+1 Redundancy Menu

N+1 Redundancy Status Menu

Navigation:
D8E1T1 Main Menu ↓ N+1 Redundancy ↓ Device Redundancy

```
                  N+1 Redundancy Status Menu

Member of Redundancy Group: No

Card Type.................: Primary
Device State..............: Online

                                 State    Change Count
                                 ---------------------
Frame Sync Pulse..............: OK             0
System Clock..................: OK             0
Backplane Timeslot Management: OK             0
Communication with System Mgr: OK             0
Rear Card.....................: OK             0
Framers.......................: OK             0

[C]lear counters
```

Figure 3-15. N+1 Redundancy Status Menu

The N+1 Redundancy Status Display is a read-only screen. The only action that can be accomplished here is pressing **C** to clear the counters. Descriptions for each field on this screen are supplied in *Table 3-2*.

Table 3-2. N+1 Redundancy Status Menu Field Descriptions

Field	Description
Member of Redundancy Group: (display field)	*Yes* means that the D8E1T1 module is a member of an N+1 Redundancy Group, while *No* means that it is not a member of an N+1 Redundancy Group.
Card Type: (display field)	Displays whether the D8E1T1 module is configured as *Primary* or *Secondary*.
Device State: (display field)	Displays the current state of the D8E1T1 module as one of the following: • **Online** - The card is good and is on the bus. • **Standby** - The card is good and is off the bus. • **Offline** - The card has general failure (failure that does not affect back-plane operations) however, it is blocked from access to the bus. • **Defective** - The card has general failure and is on the bus. • **Bus Error** - The card has bus failure (failure that will impact other buses) and is off the bus. Bus Error conditions are any or all of the following: ▪ System clock is not present ▪ Frame sync pulse is not present ▪ Front or rear card is not present.
State *(column)*	A display of *OK* in this column next to any of the status entries indicates that the function is operating properly, while a display of *Missing* indicates that it is not operating properly.
Change Count *(column)*	Displays the number of state changes since the last time the counters were cleared. Press **C** to clear the counters.
Frame Sync Pulse: (display field)	If the state is *Missing*, it indicates a loss of synchronization error.
System Clock: (display field)	If the state is *Missing*, it indicates a loss of system clock.
Backplane Timeslot Management: (display field)	If the state is *Invalid*, it indicates that the backplane is flooded with more timeslots than the module can handle.
Communication with System Mgr: (display field)	If the state is *Lost*, it indicates that the module has not received any messages from the DSMC.2 for more than one minute. ***Note*:** *If the state reads "Lost," you most likely have problems with your Octal T1/E1 Module, not the DSMC.2.*
Rear Card: (display field)	If the state is *Missing*, it indicates the rear card is not being detected. The module will reset after the rear card is detected again.
Framers: (display field)	If the state is *Bad*, it indicates that either one of the framers is bad (hardware failure).

Chapter 4

Troubleshooting and Diagnostics

4.1 Diagnostics Menu

The Diagnostics Menu provides access to several embedded diagnostic facilities, including loopbacks, built-in BERT, and viewing additional statistics.

There are multiple loopback options. Each of the eight T1/E1 links can be independently looped back, and loopbacks can occur towards the line or towards the backplane. A depiction of various loop types is provided in *Figure 4-7*.

The built-in BERT generator and testers can be used along with loopbacks to test and determine the status of the D8E1T1 links. They may also be used in conjunction with diagnostic facilities on other DXC-100 cards to qualify operation of the backplane connections. Statistics displays are also provided for monitoring and diagnostic purposes.

Navigation:
D8E1T1 Main Menu ↓ Diagnostics

Figure 4-1. Diagnostics Menu

The options available from the Diagnostics Menu are described in *Table 4-1*.

Table 4-1. D8E1T1 Diagnostics Menu Option Table

Option	Description
Line Diagnostics Center	Opens the Diagnostics Center (Diagnostics Manager Menu) Menu, where the status of the T1/E links are displayed, and from which several submenus may accessed to perform additional diagnostic actions such as loopbacks, BERT, error insertion, and viewing additional statistics.
Monitor Control Signals	Selecting *Monitor Control Signals* opens the PCM Signalling Display Menu, which allows you to monitor the payload signaling states and transceiver control signals on a per-link basis.

4.2 Diagnostics Center (Diagnostics Manager Menu)

The Line Diagnostics Center (Diagnostics Manager Menu) is used to set up line diagnostics for the D8E1T1 module.

Navigation:

D8E1T1 Main Menu
↓
Diagnostics
↓
Line Diagnostics Center

```
Diagnostics Manager
- - - - - - - - - - - -

                        Errored  Link     Bkpln           Test      Bert
  Link Name   State     Seconds  Loop     Loop   Bert     Duration  Errors
 ------------ -------- -------  -------  -----  -------  --------- ------
 Circuit Num  *ERROR*   3062    Off      Off    Off       0        0
 Circuit Num  *ERROR*   3062    Off      Off    Off       0        0
 Circuit Num  Inactive  0       Off      Off    Off       0        0
 Circuit Num  Inactive  0       Off      Off    Off       0        0
 Circuit Num  Inactive  0       Off      Off    Off       0        0
 Circuit Num  Inactive  0       Off      Off    Off       0        0
 Circuit Num  Inactive  0       Off      Off    Off       0        0
 Circuit Num  Inactive  0       Off      Off    Off       0        0

 [B]ert   [L]oop   [E]xpose   [C]lear Error Counters

 ESF [S]tatistics   15-min Performance [R]egisters   [G].826

 ------------  Hit key 1 thru 9 to insert an error  ------------
 [1]CAS Multiframe  [2]Multiframe          [3]PRBS     [4]FBit
 [5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All
```

Figure 4-2. Diagnostics Manager Menu

From the Diagnostics Manager Menu, a submenu may be viewed or invoked to perform additional diagnostic actions such as loopbacks, BERT, and viewing additional statistics including G.826 statistics.

To clear counters for all 8 links, press **C**.

The information contained in each field on the screen is detailed in the following tables.

Table 4-2. Diagnostics Manager Field Descriptions – Link Fields

Field	Description
Link Name: (display field)	Displays the user-defined name for the link, which was entered via the Configuration Menu.
DS1/E1 State: (display field)	This field displays the current status of the T1 or E1 link as one of the following: • AIS - Alarm Indication Signal: AIS is set when fewer than three zero bits are received in 512 consecutive bits or, optionally, in each of two consecutive periods of 512 bits. • CFA - Change of Frame Alignment: CFA is declared each time the offline framer generates a reframe pulse that aligns the receiver timebase to a new bit position. • *ERROR* - Undetermined error type or more than one of the above/below errors present. • LOF - Loss of Frame: Receive Loss Of Frame is declared when 3 consecutive FASs have been received in error or, additionally, if bit 2 of NFAS frames has been in error for 3 consecutive occasions. • LOS - Loss of Signal: LOS is declared if 32 contiguous zeros have been received. • OK - Link is In Service and functioning properly. Inactive - Link is out of service. • RED - Red Alarm: Red Alarm or Carrier Fault Alarm declared when an out-of-frame condition has been present for 2.55 sec (± 40 ms). • RX-SLIP - Receive Slip: Controlled slip has been detected on the incoming path. • SEF - Severely Errored Frame is reported when the receive signal does not meet requirements of ANSI T1.231. SLIP - Slip has been detected in both the incoming and outgoing paths. • TX-SLIP - Transmit Slip: Controlled slip has been detected on the outgoing path. • UnderTst - BERT is currently running on the link. • YEL - Yellow Alarm: For T1, declares a Yellow Alarm when the Yellow pattern has been received for 425 ms (± 50 ms). For E1, declared when an Alarm Indication is received via TS-0 overhead (E1).
DS1/E1 ErrSecs (Errored Seconds): (display field)	Displays the number of errored seconds that have occurred on the T1 or E1 link since the last time that the counter was reset. The occurrence of a Loss of Frame, CRC6, or CRC4 error in a one-second period is known as an errored second.
Link Loop: (display field)	This field displays the type of diagnostic loop that has been enabled, or *Off* is displayed if no loop has been enabled. A depiction of various loop types is provided in *Figure 4-7*.
Bkpln Loop (Backplane Loop): (display field)	*On* displayed in this field indicates that a backplane loop is enabled. A depiction of various loop types is provided in *Figure 4-7*.

Table 4-3. Diagnostics Manager Field Descriptions – BERT Fields

Field	Description
BERT (Testing State): (display field)	Displays the type of BERT that is currently enabled. If BERT is not enabled, then Off is indicated. Refer to the section titled *BERT (Bit Error Rate Test)* for a list of the possible displayed states.
BERT (Test Duration): (display field)	Displays the amount of time (in seconds) that BERT has been enabled.
BERT (Testing) Errors: (display field)	Displays the number of errored seconds that have occurred since BERT was enabled.

4.3 Diagnostic Test Options

The following are diagnostic tests and status displays that can be enabled on the T1/E1 links. To run these tests, place your cursor on a numbered link and press a *hot key* (see choices below):

Table 4-4. Diagnostic Test Options

Option	Description
[B]ert	Allows you to select several pseudo-random test patterns for testing the T1/E1 links. Selectable only in Clear T1/E1 Disabled mode.
[L]oop	Allows you to enable several different loopbacks for the T1/E1 links. Selectable in all modes.
[E]xpose	Allows you to display the status of the link and run additional procedures such as re-initializing the T1/E1 framers and injecting known errors. Selectable in all modes.
[C]lear Error Counters	Allows you to clear all errored second and BERT counters. Selectable in all modes.
ESF [S]tatistics	Allows you to view the *ESF Statistics Display*, which shows current and 24-hour statistics for the specific ESF link. Framing Statistics are only available in Clear T1/E1 Disabled mode.
15-min Performance [R]egisters	Allows you to view the *15-Minute Performance Registers Display*, which gives the same information as the *ESF Statistics Display* but it is broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period. Framing Statistics are only available in Clear T1/E1 Disabled mode.
[G].826:	Allows you to view the G.826 Statistics Display, which provides G.826 performance statistics for a given T1 or E1 link for the duration of time that the link has been up and running.

The procedures for running diagnostics and viewing statistics are detailed on the next several pages.

4.4 BERT (Bit Error Rate Test)

BERT is used to test the bit error rate of the communication circuit. The device checks for errors by comparing a received data pattern with a known transmitted data pattern to determine transmission line quality. If a pattern match cannot be found, Errored Seconds counts are incremented to record the time during which a pattern lock in the receive path could not be established. For troubleshooting purposes, combining BERT with diagnostic loops is very useful in isolating problems within a circuit. For the D8E1T1 module, there are 12 available BERT patterns for the T1/E1 links (when in Clear T1/E1 Disabled mode).

T1/E1 Link BERT

Navigation:
D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select a T1/E1 Link ↓ [B]ert

```
                                BERT Select
                               -------------

                    Link Number..: 1
                    Link Name....: Circuit Number
                    Current BERT.: Off
                    New BERT.....: Off


Available Bit Error Tests (BERTs)
---------------------------------
[o]ff
[A] Framed 2047                          [0] Framed All Zeros (0x00)
[C] Framed 2^15                          [1] Framed All Ones (0xFF)
[D] Framed 2^20                          [2] Framed 3 in 24 (0x44,0x00,0x04)
[E] Framed 2^23                          [3] Framed 1 in 8 (0x40)
[F] Framed 2^11 - 7 0's limits
[G] Framed 2^15 - 7 0's limits
[H] Framed QRSS
[I] Framed 2^23 - 14 0's limits
```

Figure 4-3. BERT Select Menu

Note *The link must be in service and Clear T1/E1 must be disabled in order to perform BERT.*

1. To select a BERT pattern, either place the cursor on the *New BERT* field and press **<Enter>** to cycle through the choices, OR press the specific *hot key* indicated on the bottom of the menu. The selectable patterns and corresponding *hot keys* are shown in *Table 4-5*.

Table 4-5. BERT Selections

Option	Description
	DS1/E1 BERT
[A]	Framed 2047
[C]	Framed 2 ^ 15 (Inverted Pattern according to ITU 0.151)
[D]	Framed 2 ^ 20
[E]	Framed 2 ^ 23 (Inverted Pattern according to ITU 0.151)
[F]	Framed 2 ^ 11 - 7 0's limits
[G]	Framed 2 ^ 15 - 7 0's limits
[H]	Framed QRSS
[I]	Framed 2 ^ 23 - 14 0's limits
[0]	Framed All Zeros (0x00)
[1]	Framed All Ones (0xFF)
[2]	Framed 3 in 24 (0x44, 0x00, 0x04)
[3]	Framed 1 in 8 (0x40)
	Other Selections
[O]	Off

2. Press **X** to start the test. The following prompt appears:

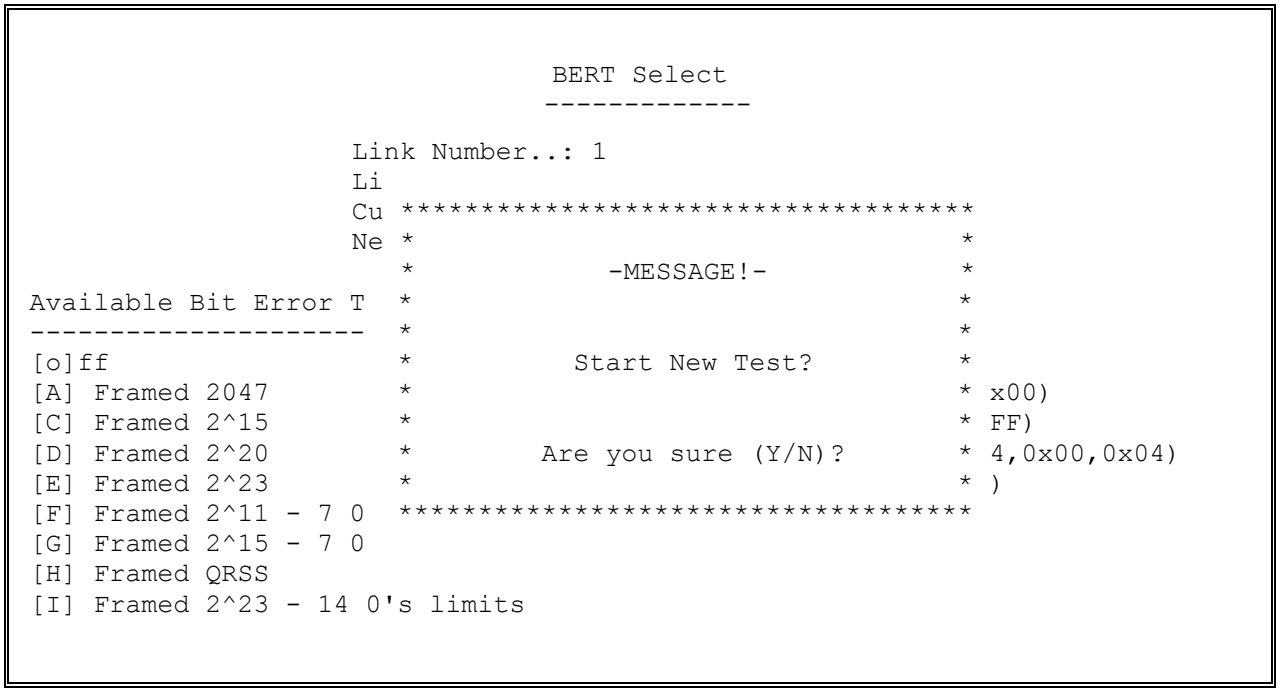

Figure 4-4. Start New Test Prompt

3. Press **Y** to initiate the test and return to the Diagnostics Manager menu or press **N** to cancel and return to the BERT Selection submenu.
4. From the BERT Selection submenu, press **<Esc>** twice to return to the Diagnostics Manager menu.

Stop Link BERT

1. From the Diagnostics Manager menu, press **B** and the BERT Select submenu appears.
2. With the cursor on the *New BERT* field, press the letter **O**.
3. Press **X** to stop the test.
4. When prompted: "`Stop Bit Error Test? Are you sure (Y/N)?`" Press **Y** to stop the test and return to the Diagnostics Manager menu or press **N** to cancel and return to the BERT Selection submenu.
5. From the BERT Selection submenu, press **<Esc>** twice to return to the Diagnostics Manager menu.

4.5 Diagnostic Loops

Diagnostic Loops include several types of Network Interface (NI) Loops (Local, Line, Analog, Remote, Payload, SmartJack, and User Defined) as well as a Backplane Loop. Each of the 8 links can be independently looped back. These loops can be enabled from the *Loop Selection* screen as detailed below. A diagram depicting all loopbacks is shown in *Figure 4-7*.

Navigation:
D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select a T1/E1 Link ↓ [**L**]oop

```
                                Link: 1

                            Loop Select Screen
                            ------------------

                           NI Loop Type..: Off
                           Backplane Loop: Off


NI Loop Type  : [O]ff   [L]ocal   Li[n]e   [A]nalog   [R]emote   [P]ayload
                [S]martJack    [U]ser Defined
Backplane Loop: [T]oggle
```

Figure 4-5. Loop Selection Screen

1. To select a specific loop, either place the cursor on the *NI Loop Type* field and press **<Enter>** to cycle through the choices OR press the specific key indicated on the bottom of the menu. The selectable Link loops are described in *Table 4-6*, and illustrated in *Figure 4-7*.
2. Once you have selected a loop, press **X** to enable it. The following prompt appears:

```
                                Link: 1

                        ************************************
                        *                                  *
                        *            -MESSAGE!-            *
                        *                                  *
                        *                                  *
                        *      Process Loop Command ?      *
                        *                                  *
                        *                                  *
                        *        Are you sure (Y/N)?       *
                        *                                  *
                        ************************************


NI Loop Type  : [O]ff    [L]ocal    Li[n]e  [A]nalog  [R]emote  [P]ayload
                [S]martJack [U]ser Defined
Backplane Loop: [T]oggle
```

Figure 4-6. Process Loop Prompt

3. Press **Y** to initiate the loop, and you are returned to the Diagnostics Manager Menu. Press **N** to exit and return to the Diagnostics Manager Menu.

Table 4-6. Loop Selection Screen Options

Option	Description
[O]ff	No loopbacks are enabled.
[L]ocal	Local Loop causes data from the DXC-100 to be looped back to itself at the Network Interface port. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode). See *Figure 4-7* for a visual representation of this loopback.
Li[n]e	Line Loop causes frames at the NI to be looped back towards the network from the DXC-100 unit where the command was entered. The framing is not regenerated. In a point-to-point circuit, Line Loop is useful for looping back any testing initiated by the other end. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode). See *Figure 4-7* for a visual representation of this loopback.
[A]nalog	Analog Line Loop causes frames at the NI to be looped back towards the network from the DXC-100 unit where the command was entered. The framing is not regenerated. In a point-to-point circuit, Analog Line Loop is useful for looping back any testing initiated by the other end. (Use in Clear T1/E1 Disabled, Framed, and Unframed Mode). See *Figure 4-7* for a visual representation of this loopback.
[R]emote	Remote Loop causes a loop at the distant end of a point-to-point circuit, and is useful for looping back testing initiated from the local side. (Use in Clear T1/E1 Disabled Mode). *Note: Payload loop will not function when using Clear T1/E1 Unframed mode.* See *Figure 4-7* for a visual representation of this loopback.
[P]ayload	Payload Loop is very similar to a Line Loop, except that it only loops the data (payload) and the framing is regenerated. (Use in Clear T1/E1 Disabled Mode. *Note: Payload loop will not function when using Clear T1/E1 Unframed mode.* See *Figure 4-7* for a visual representation of this loopback.
[S]martJack	Transmits a code that is recognized by a remote SmartJack, which then puts itself into loopback towards the DXC-100. See *Figure 4-7* for a visual representation of this loopback.
[U]ser Defined	Similar to a Smart Jack Loop, this feature allows you to place remote equipment into loopback by sending a code to the equipment. The proper code needs to be obtained from the remote equip- ment's manufacturer or operator. Various elements of the code can be defined, such as the length and value for both the activate and deactivate code. See *User-Defined Loop* for further explanation of this loopback and how to set it up.
Backplane Loop (Toggle): (option field)	Backplane Loop is designed to check the integrity of the backplane and allow testing through the D8E1T1 port from the remote side to the backplane and back to the tester. Select *Yes* to enable the backplane loop, and *No* to disable the backplane loop.

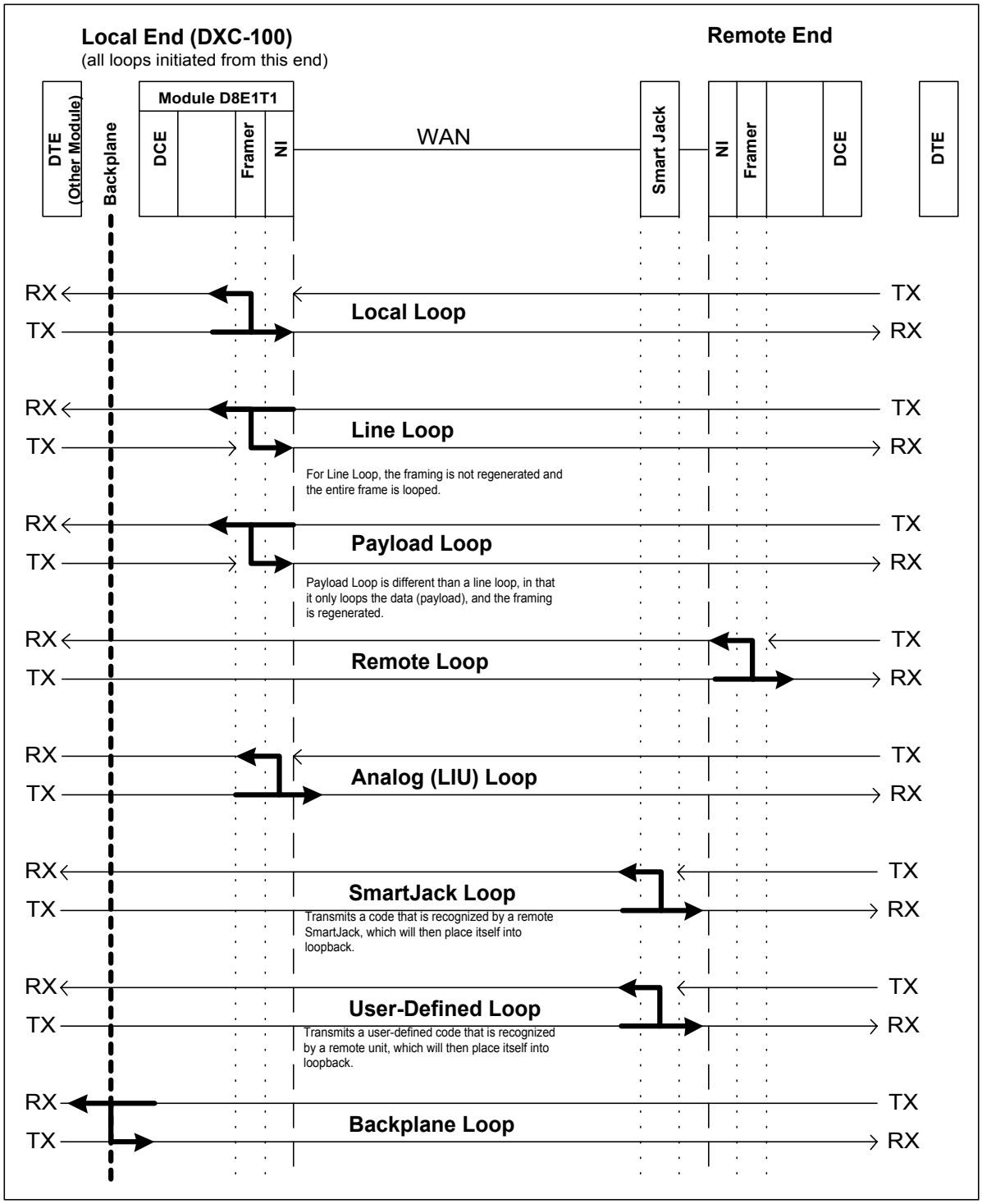
Local End (DXC-100)
(all loops initiated from this end)
Remote End
DTE (Other Module)
Backplane
Module D8E1T1
DCE
Framer
NI
WAN
Smart Jack
NI
Framer
DCE
DTE
RX
TX
Local Loop
Line Loop
For Line Loop, the framing is not regenerated and the entire frame is looped.
Payload Loop
Payload Loop is different than a line loop, in that it only loops the data (payload), and the framing is regenerated.
Remote Loop
Analog (LIU) Loop
SmartJack Loop
Transmits a code that is recognized by a remote SmartJack, which will then place itself into loopback.
User-Defined Loop
Transmits a user-defined code that is recognized by a remote unit, which will then place itself into loopback.
Backplane Loop

Figure 4-7. D8E1T1 Diagnostic Loops

User-Defined Loop

A User-Defined Loop is similar to a Smart Jack Loop. It allows you to place remote equipment into loopback by sending a specific code to the equipment. The proper code needs to be obtained from the remote equipment's manufacturer or operator. Several elements of the code can be defined, such as the length and value for both the activate and deactivate code.

1. From the Loop Selection Menu, either place the cursor on the *NI Loop Type* field and press **<Enter>** to cycle through the choices until *User Defined* is displayed OR press **U** (hot key).
2. Next, press **X** to select the loop. The User Defined Loop parameter selection fields appear:

```
                                Link: 1

                           Loop Select Screen
                           ------------------

                           NI Loop Type..: User Defined
                           Backplane Loop: Off

                                  Length       Value
                                  ------       -----
                     Activate Code..: 5 bits       00001000
                     Deactivate Code: 6 bits       00100100
                     Unframed.......: Yes

Notes: - Loop code uses 4,5,6 or 7 high order bits of the code value.
       - Bit 7 is transmitted first.
       - Unframed code overwrites the framing bits.
```

Figure 4-8. User Defined Loop Select Screen

3. Enter the remote loopback codes as specified by the remote equipment's manufacturer or operator. Refer to the field descriptions in *Table 4-7* to assist you in setting up a User- Defined Loop.

Note *You must configure the corresponding activate and deactivate codes prior to activating the loop, otherwise the loop will not be activated.*

4. Once the parameters of the loop have been defined, press **X** to save and activate the loop command. When the Process Loop Command Prompt (*Figure 4-6*) appears, press **Y**. The loop command will be sent to the remote equipment.

Table 4-7. User-Defined Loop Field Descriptions

Field	Description
Activate Code - Length: (option field)	Defines the length of the code needed to activate a remote loop. Select *4*, *5*, *6*, or *7* bits. The default is *5* bits.
Activate Code - Value: (text field)	Used to enter the binary code needed to activate a remote loop. The default is *00001000*.
Deactivate Code - Length: (option field)	Defines the length of the code needed to deactivate a remote loop. Select *4*, *5*, *6*, or *7* bits. The default is *6* bits.
Deactivate Code - Value: (text field)	Used to enter the binary code needed to deactivate a remote loop. The default is *00100100*.
Unframed: (option field)	Select *Yes* if the loopback command can over-write the framing bits, or *No* if it cannot.

Backplane Loop

The Backplane Loop is designed to check the integrity of the Backplane and allow testing through the D8E1T1 port from the remote side to the backplane and back to the tester. The backplane loop is shown as part of *Figure 4-7*.

1. Move your cursor to the *Backplane Loop* field and press **<Enter>** or press **T** to toggle the backplane loop *On* or *Off*.
2. Press **X** to enable the Backplane Loop. The Process Loop Command Prompt appears.
3. Press **Y** to initiate the backplane loop, and you are returned to the Diagnostics Manager Menu. Press **N** to exit and return to the Diagnostics Manager Menu.

Note *There must be a connection to another module or to the D8E1T1 module itself mapped on the backplane in order for the backplane loop to function.*

4.6 Expose (Link Status)

The *Expose* function is used to display the status of the T1/E1 links, access G.826 statistics, reinitialize the framer, and insert errors for diagnostic purposes.

Expose - T1/E1 Link Status

Navigation:
D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select a T1/E1 Link ↓ [E]xpose

For a T1 Link, the following display appears:

```
                              T1/E1 Link Status
                              -----------------

 Link#: 1    Name: Circuit Number
 -------------- State  ErroredSec
 Red Alarm.....: Off     0          Crc Errors........: 0
 Yellow Alarm..: Off     0          Bpv Errors........: 0
 Loss Of Signal: Off     0          Frame Bit Errors...: 0
 AIS Indication: Off     0          Trunk Conditioning.: On
 Out Of Frame..: Off     0
 SEF Indication: Off     0
 Transmit Slip.: Off     0
 Receive Slip..: Off     0

[C]lear Counters Re[i]nitialize

 ESF [S]tatistics 15-min Performance [R]egisters [G].826
 ------------ Hit key 1 thru 9 to insert an error
 [1]CAS Multiframe  [2]Multiframe          [3]PRBS     [4]FBit
 [5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All
```

Figure 4-9. T1/E1 Link Status Menu (T1 Link)

For an E1 Link, the following display appears:

```
                              T1/E1 Link Status
                              -----------------

Link#: 6 Name: Circuit Number
-------------- State ErroredSec
RAI...........: Off    0         Crc Errors.........: 0
MFRAI.........: Off    0         Bpv Errors.........: 0
Loss Of Signal: Off    0         Frame Bit Errors...: 0
AIS Indication: Off    0         Trunk Conditioning.: On
Out Of Frame..: Off    0         Far End Block Errs.: 0
SEF Indication: Off    0
Transmit Slip.: Off    0
Receive Slip..: Off    0


 [C]lear Counters   Re[i]nitialize

ESF [S]tatistics   15-min Performance  [R]egisters   [G].826
------------  Hit key 1 thru 9 to insert an error  -----------------
[1]CAS Multiframe  [2]Multiframe          [3]PRBS     [4]FBit
[5]Frame Alignment [6]Line Code Violation [7]Bit Slip [8]CRC [9] All
```

Figure 4-10. T1/E1 Link Status Menu (E1 Link)

The information contained in each field on the screen is detailed in *Table 4-8* on the following page. Some of the fields are context sensitive, (e.g., the CRC errors only appear for links that support CRC such as T1 ESF or E1 CRC). An error-free link will display zeroes in all counter fields.

From the T1/E1 Link Status submenu, you can do the following:

- Press **C** to clear counters for the selected link (refer to *page 4-16*).
- Press **S** to view ESF Statistics (refer to *page 4-16*).
- Press **i** to reinitialize the T1/E1 framer (refer to *page 4-18*).
- Press **R** to view 15-Minute Performance Registers (refer to *page 4-19*).
- Press **G** to view G.826 Statistics (refer to *page 4-21*).

You can also use keys **1** through **9** to insert errors from the NI side, which is then shown on the remote side. If the remote side is line looped, the inserted errors will be seen on the local side, under Errored Seconds.

Table 4-8. T1/E1 Link Status Menu Field Descriptions

Field	Description
Link#: (display field)	Displays the link number of the exposed link.
Name: (display field)	Displays the user-defined name for the link, which was entered via the Configuration Menu.
Error: (column)	Displays the type of error for the specific T1/E1 link.

Table 4-8. T1/E1 Link Status Menu Field Descriptions (Cont.)

Field	Description
State: (column)	A display of *On* in this column next to any of the *Error* entries indicates that an error condition currently exists on the T1 or E1 link. A display of *Off* indicates that the error condition is not present, but if the errored seconds field has a count, then this alarm has occurred sometime in the past (since the last time that the counter was cleared). **Note:** *All Error and Alarm states will only be detected in Clear T1/E1 Disabled mode, except for LOS and BPV. These will also be detected in Clear T1/E1 Framed mode.*
ErrSecs (Errored Seconds): (column)	The display count in this column indicates the quantity of seconds that the error condition on the T1 or E1 link has been present or was present. Press **C** to clear the counters for this link.
Red Alarm: (T1 display field)	A display of *On* indicates that a loss of frame alignment has occurred and synchronization has been lost.
Yellow Alarm: (T1 display field)	A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not correctly receiving the DXC-100 signal (the network is not in sync or a Red Alarm has occurred).
RAI: (E1 display field)	A display of *On* indicates that a Remote Alarm Indication has been received (via TS-0 overhead).
MFRAI: (E1 display field)	A display of *On* indicates that a Far end Channel Associated Signalling (CAS) Multi-Frame (MF) alarm indication received (via TS-16 overhead).
Loss of Signal: (display field)	This field will display *On* to indicate a loss of signal detection. No T1 or E1 signal is present on the RX pair to the DXC-100.
AIS Indication: (display field)	A display of *On* indicates that an unframed “all ones” condition has been detected. After AIS (Alarm Indication Signal) is detected, the system will return a yellow alarm signal and pass on channel trunk conditioning.
Out of Frame: (display field)	A display of *On* indicates that the received link data stream does not meet pre-set framing criteria.
SEF Indication: (display field)	A display of *On* indicates that a Severely Errored Frame has been detected (the receive signal does not meet the requirements of ANSI T1.231).
Transmit Slip: (display field)	A display of *On* indicates that slip has been detected in the outgoing path.
Receive Slip: (display field)	A display of *On* indicates that slip has been detected in the incoming path.
CRC Errors (Cyclic Redundancy Check Errors): (display field)	The CRC test is a 6-bit algorithm that checks the content of the entire frame. For T1 (ESF framing), this field indicates the number of CRC6 block errors that have been detected. D4 framing does not include CRC6; DXC-100 replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance. For E1, this field indicates the number of CRC4 block errors that have been detected.
Bpv Errors (Bi-Polar Violation Errors): (display field)	This field is a counter that records the number of Bipolar Violations that have been detected. This usually indicates that a very weak or excessively strong signal is being received from the network.

Table 4-8. T1/E1 Link Status Menu Field Descriptions (Cont.)

Field	Description
Frame Bit Errors: (display field)	This field is a counter that records the number of frame alignment bit errors that have been detected. This does not mean that synchronization has been lost.
Trunk Conditioning: (display field)	If trunk conditioning status is *On* and the control bits indicate a Red or Yellow alarm is being received, the following occurs: • Receive data is disabled at all timeslots. • Idle code is written to corresponding slip buffer according to content of each timeslot (data/voice). If trunk conditioning status is *Off*, then no alarms are being received.
Far End Block Errors: (display field) (E1 CRC and E1-CAS-CRC Only)	This field is a counter that records the number of Far End Block Errors that have been detected (Remote CRC errors are reported as FEBEs).

Clear Counters

You may elect to either clear the error counters for a specific link, or for all links.

Note *There are no prompts for clearing the counters. All counters are cleared immediately.*

Clear Counters for an Individual T1/E1 Link

Navigation:

D8E1T1 Main Menu
↓
Diagnostics
↓
Line Diagnostics Center
↓
Select a T1/E1 Link
↓
[E]xpose
↓
[C]lear Counters

Note *If you do not first press **E** (Expose) for the individual link before pressing **C** (Clear Counters), ALL link counters will be cleared.*

ESF Statistics

The ESF Statistics Display is a read-only display. It allows you to view both current and 24-hour ESF Statistics. The Current Statistics column displays the counts for the current time interval (maximum 15 minutes). The 24 Hour Statistics column displays the counts for the preceding 24-hour period. The information has no meaning in Clear T1/E1 Unframed mode.

Note *ESF Statistics cannot be displayed for a D4-framed or E1 link.*

Navigation:		
D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select T1/E1 Link ↓ ESF [**S**]tatistics	OR	D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select T1/E1 Link ↓ [**E**]xpose ↓ ESF [**S**]tatistics

```
                ESF Statistics For Port#: 1

                Register Curr 24 Hr
                --------------------------------
                Errored seconds.........: 0 1
                Failed seconds (UAS)....: 727 5391
                Severely errored seconds: 0 1
                Bursty errored seconds..: 0 0
                Loss of frame count.....: 0 0
                Time in interval........: 727
                # Valid intervals.......: 6
                ESF status..............: FU000000
```

Figure 4-11. ESF Statistics Display

The information contained in each field on the screen is detailed in *Table 4-9*.

Table 4-9. ESF Statistics Display Field Descriptions

Field	Description
Errored Seconds: (display field)	The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.
Failed Seconds (UAS): (display field)	Each one-second period during the occurrence of a Failed Signal State (10 consecutive errored seconds) is known as a failed second. This field displays the number of failed seconds that have occurred.
Severely Errored Seconds: (display field)	A one-second period in which 320 or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.
Bursty Errored Seconds: (display field)	A one-second period in which more than one but less that 320 CRC6 errors have occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

Table 4-9. ESF Statistics Display Field Descriptions (Cont.)

Field	Description
Loss of Frame Count: (display field)	A loss of frame occurs when either Network equipment or the DTE senses errors in the framing pattern. Depending upon the equipment, this occurs when any 2 of 4, 2 of 5, or 3 of 5 consecutive terminal framing bits received contain bit errors in the framing pattern.
Time in Interval: (display field)	A timer that tracks the number of seconds (0-900) since the start of the current 15-minute interval.
# Valid Intervals: (display field)	A counter that tracks the total number of 15-minute intervals in a 24 hour period (up to 96).
ESF Status: (display field)	This field defines the status of the T1/E1 line. The status is defined by an 8-digit number that is described below: *Example: F00000L0* *Digit #1 - "F" or "0" where "F" indicates Failed Signal State (FSS) if "U" or "L" is true.* *Digit #2 - "U" or "0" where "U" indicates an unavailable signal state.* *Digit #3 through #6 and #8 are always "0."* *Digit #7 - "L" or "0" where "L" indicates that the T1 line is in loop.*

Re-initialize T1/E1 Framer

The Re-initialize function is used to reset the T1/E1 link framer to its default values. It is used to rewrite values for the framer if you suspect that a configuration change didn't take or odd problems are occurring on the status displays. This function will only reset the T1/E1 link framer, not the entire module.

Caution Re-initializing the framer will cause data to be momentarily interrupted for the selected link.

Navigation:

D8E1T1 Main Menu
↓
Diagnostics
↓
Line Diagnostics Center
↓
Select a T1/E1 Link
↓
[E]xpose
↓
Re[i]nitialize

```
                              T1/E1 Link Status
                              -----------------

Link#: 1 Name: Circuit Number
-------------- Stat
Red Alarm.....: On  ************************************
Yellow Alarm..: Off *                                  *
Loss Of Signal: On  *              -MESSAGE!-          *
AIS Indication: Off *                                  *
Out Of Frame..: On  *                                  *
SEF Indication: On  *  Reset and re-configure the framer? *
Transmit Slip.: Off *                                  *
Receive Slip..: Off *                                  *
                    *          Are you sure (Y/N)?      *
                    *                                  *
                    ************************************


[C]lear Counters    Re[i]nitialize

ESF [S]tatistics    15-min Performance    [R]egisters   [G].826
------------ Hit key 1 thru 9 to insert an error-----------------------
[1]CAS Multiframe   [2]Multiframe            [3]PRBS       [4]FBit
[5]Frame Alignment  [6]Line Code Violation   [7]Bit Slip   [8]CRC   [9] All
```

Figure 4-12. Reset Framer Prompt

1. Press **Y**. The T1/E1 framer will be re-initialized, and you are returned to the T1/E1 Link Status submenu. Press **N**, and you are returned directly to the T1/E1 Link Status Menu without the framers being re-initialized.

15-Minute Performance Registers

The 15-Minute Performance Registers Display is a read-only display. It provides the same information as the ESF Statistics Display, but it is broken down by link for each of the ninety-six 15-minute intervals in the preceding 24-hour period. The information has no meaning in Clear T1/E1 Unframed mode.

Navigation:		
D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select T1/E1 Link ↓ 15-min Performance [**R**]egisters	OR	D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select T1/E1 Link ↓ [**E**]xpose ↓ 15-min Performance [**R**]egisters

Note *15-Minute Performance Registers cannot be displayed for a D4-framed link.*

```
15-min Performance Registers For Port#: 2
 INT ES  FS  SES BES    INT ES  FS  SES BES    INT ES  FS  SES BES
 ------------------------------------------------------------------
 01. 000 900 000 000    17. 000 000 000 000    33. 000 000 000 000
 02. 000 900 000 000    18. 000 000 000 000    34. 000 000 000 000
 03. 000 900 000 000    19. 000 000 000 000    35. 000 000 000 000
 04. 000 900 000 000    20. 000 000 000 000    36. 000 000 000 000
 05. 001 891 001 000    21. 000 000 000 000    37. 000 000 000 000
 06. 000 000 000 000    22. 000 000 000 000    38. 000 000 000 000
 07. 000 000 000 000    23. 000 000 000 000    39. 000 000 000 000
 08. 000 000 000 000    24. 000 000 000 000    40. 000 000 000 000
 09. 000 000 000 000    25. 000 000 000 000    41. 000 000 000 000
 10. 000 000 000 000    26. 000 000 000 000    42. 000 000 000 000
 11. 000 000 000 000    27. 000 000 000 000    43. 000 000 000 000
 12. 000 000 000 000    28. 000 000 000 000    44. 000 000 000 000
 13. 000 000 000 000    29. 000 000 000 000    45. 000 000 000 000
 14. 000 000 000 000    30. 000 000 000 000    46. 000 000 000 000
 15. 000 000 000 000    31. 000 000 000 000    47. 000 000 000 000
 16. 000 000 000 000    32. 000 000 000 000    48. 000 000 000 000

                                          [N]ext Page
```

Figure 4-13. 15-Minute Performance Registers Display

Press **N** to view the next 48 intervals. The information contained in each field on the screen is detailed in *Table 4-10*.

Table 4-10. 15-Minute Performance Registers Display Field Descriptions

Field	Description
INT (Interval): (display field)	The interval number for the ninety-six 15-minute intervals preceding the current interval, with *01* being the most recent.
ES (Errored Seconds): (display field)	The occurrence of a Loss of Frame or a CRC6 error in a one-second period is known as an errored second. This field displays the number of errored seconds that have occurred.
FS (Failed Seconds): (display field)	Each one-second period during the occurrence of a Failed Signal State (ten consecutive errored seconds) is known as a failed second. This field displays the number of severely errored seconds that have occurred.
SES (Severely Errored Seconds): (display field)	A one-second period in which three hundred twenty (320) or more CRC6 errors have occurred is known as a severely errored second. This field displays the number of severely errored seconds that have occurred.
BES (Bursty Errored Seconds): (display field) (displayed for T1 links only)	A one-second period in which more than one but less than 320 CRC6 errors has occurred is known as a bursty errored second. This field displays the number of bursty errored seconds that have occurred.

G.826 Statistics

The G.826 Statistics Display provides G.826 performance statistics for a given T1 or E1 link for the duration of time that the link has been up and running.

Navigation:

D8E1T1 Main Menu
↓
Diagnostics
↓
Line Diagnostics Center
↓
Select a T1/E1 Link
↓
[E]xpose
↓
[**G**].826

Note *When the link is configured for E1 (without CRC) or T1 D4 framing, the G.826 Statistics Display is not accessible.*

```
                          G.826 Statistics
                          ----------------


                  Link#: 1

                  Total Time.........................: 5316
                  Errored Seconds....................: 0
                  Error Free Seconds.................: 0
                  Severely Errored Seconds...........: 0
                  Consecutive Severely Errored Seconds: 0
                  Consecutive Error Free Seconds.....: 0
                  Background Block Error.............: 0
                  Unavailable Seconds................: 5316
                  Errored Seconds Ratio..............: 0.00 %
                  Severely Errored Seconds Ratio.....: 0.00 %
                  Background Block Error Ratio.......: 0.00 %


[C]lear Counters
```

Figure 4-14. G.826 Statistics Display

The G.826 Statistics Display is a read-only screen. The only action that can be accomplished here is pressing **C** to clear the counters. Descriptions for each field on this screen are supplied in *Table 4-11*.

Table 4-11. G.826 Statistics Field Descriptions

Field	Description
Link #: (display field)	Displays the number of the link for which the status is being presented.
Total Time: (display field)	Displays the amount of time (in seconds) that the link has been up and running.
Errored Seconds: (display field)	A one-second period with one or more errored blocks or at least one defect is known as an errored second. This field displays the number of errored seconds that have occurred since the last counter reset.
Error Free Seconds: (display field)	A one-second period of time during which the link was error-free. This field represents the number of error-free seconds that have occurred.
Severely Errored Seconds: (display field)	A subset of errored seconds, a one-second period in which more than 30% of the blocks contain errors is known as a severely errored second. This field displays the number of severely errored seconds that have occurred since the last counter reset.
Consecutive Severely Errored Seconds: (display field)	A continuous occurrence of severely errored seconds, in one-second intervals, which contain >30% or more errored blocks. This field represents the number of consecutive severely errored seconds that have occurred since the last counter reset.
Consecutive Error Free Seconds: (display field)	A display of consecutive one-second period intervals that did not have defects or errors on the link. This field displays the number of consecutive error-free seconds that have occurred since the last counter reset.
Background Block Error: (display field)	An errored block not occurring as part of a severely errored second. This field displays the number of background block errors that have occurred since the last counter reset.
Unavailable Seconds: (display field)	The number of unavailable seconds that have occurred on the link during the current interval. At the onset of 10 consecutive SES events, a period of unavailable seconds begins. These 10 seconds are part of the unavailable seconds count. At the end of 10 consecutive non-SES events, a new period of available time begins. These 10 seconds are part of available time. Unavailable seconds are not counted when factoring ratios.
Errored Seconds Ratio: (display field)	Displays the ratio of errored seconds to total seconds in available time during a fixed measurement interval.
Severely Errored Seconds Ratio: (display field)	Displays the ratio of severely errored seconds to total seconds in available time during a fixed measurement interval.
Background Block Error Ratio: (display field)	Displays the ratio of background block errors to total blocks in available time during a fixed measurement interval. The count of total blocks excludes all blocks during severely errored seconds.

Error Insertion

For diagnostic purposes, specific errors can be inserted and momentarily transmitted either directly to a remote unit or looped back to the D8E1T1 module.

Note *Errors cannot be inserted into an unframed link; the error-insertion hot keys will be disabled when a link is in unframed mode.*

Navigation:		
D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select T1/E1 Link ↓ Specific Error Hot Key	OR	D8E1T1 Main Menu ↓ Diagnostics ↓ Line Diagnostics Center ↓ Select T1/E1 Link ↓ [**E**]xpose ↓ Specific Error Hot Key

```
                              T1/E1 Link Status
                              -----------------

Link#: 1    Name: Circuit Number
-------------- State  ErroredSec
Red Alarm.....: On      0         Crc Errors.........: 0
Yellow Alarm..: Off     0         Bpv Errors.........: 0
Loss Of Signal: On      0         Frame Bit Errors...: 0
AIS Indication: Off     0         Trunk Conditioning.: On
Out Of Frame..: On      0
SEF Indication: On      0
Transmit Slip.: Off     0
Receive Slip..: Off     0


[C]lear Counters    Re[i]nitialize

ESF [S]tatistics    15-min Performance [R]egisters [G].826
------------ Hit key 1 thru 9 to insert an error------------------------
[1]CAS Multiframe   [2]Multiframe           [3]PRBS      [4]FBit
[5]Frame Alignment  [6]Line Code Violation  [7]Bit Slip  [8]CRC  [9] All
```

Figure 4-15. T1/E1 Link Status Menu - Error Insertion Choices

1. Press the specific numeric key indicated on the bottom of the menu to insert a momentary error. The errors and their corresponding *hot keys* are detailed in *Table 4-12*.

Table 4-12. T1/E1 Link Error Insertion Selections

Option	Description
[1] CAS Multiframe	Injects a single MAS pattern error by performing a logical inversion of the first MAS bit transmitted.
[2] Multiframe	MultiFrame Error - Causes Fs (T1 D4/SF and ESF) or MFAS (E1 CAS and NSA) by logically inverting the next frame bit/word transmitted.
[3] PRBS	Injects a single PRBS error by logically inverting the next PRBS generator output bit.
[4] FBit	Injects a single frame bit error by performing a logical inversion of the next frame bit transmitted.
[5] Frame Alignment	Forces a one-bit shift in the location of transmit frame alignment by deleting (or inserting) one bit position from the transmit frame.
[6] Line Code Violation	Injects a single Line Code Violation error.
[7] Bit Slip	Injects a bit slip error by deleting or repeating one data frame. The framer determines in which direction the bit slip will occur.
[8] CRC	Injects a single CRC-6 (T1 ESF) or CRC-4 (E1 CAS/CRC and NSA/CRC) bit error by performing a logical inversion of the next CRC bit transmitted.
[9] All	Injects all of the above errors concurrently (as applicable).

2. Once the appropriate *hot key* has been pressed, a prompt similar to *Figure 4-16* appears. It displays the type of error that will be inserted.

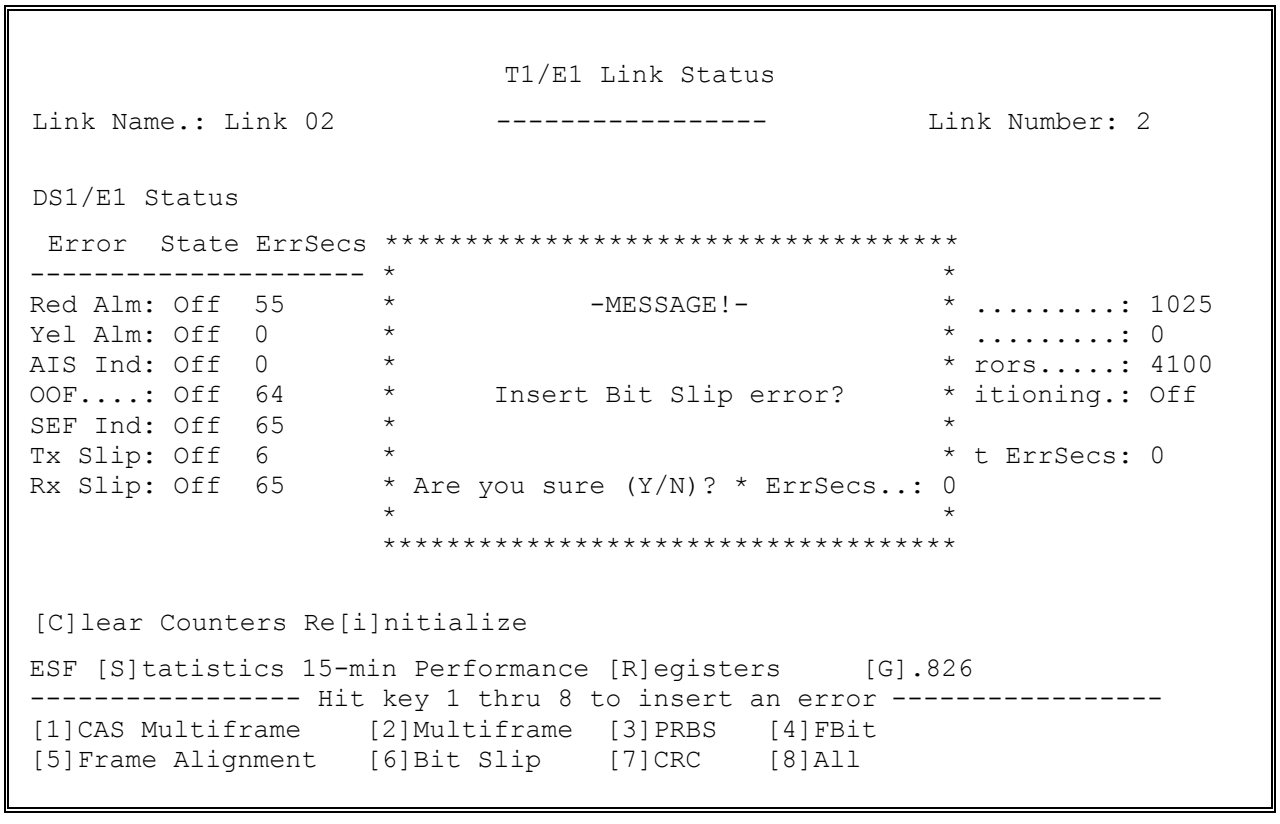

Figure 4-16. Error Insertion Prompt (Typical)

3. Press **Y** to insert the error. Once the error has been inserted, you are returned to the T1/E1 Link Status Menu, where you can view error status.

4.7 Monitor Control Signals (PCM Signalling Display Menu)

Selecting the Monitor Control Signals option will open the PCM Signalling Display menu, which displays the state of the AB, and/or ABCD signaling bits within a PCM (T1 or E1) stream. The state "N/A" applies to unassigned or data-only timeslots in the PCM stream.

Navigation:
D8E1T1 Main Menu ↓ Diagnostics ↓ Monitor Control Signals

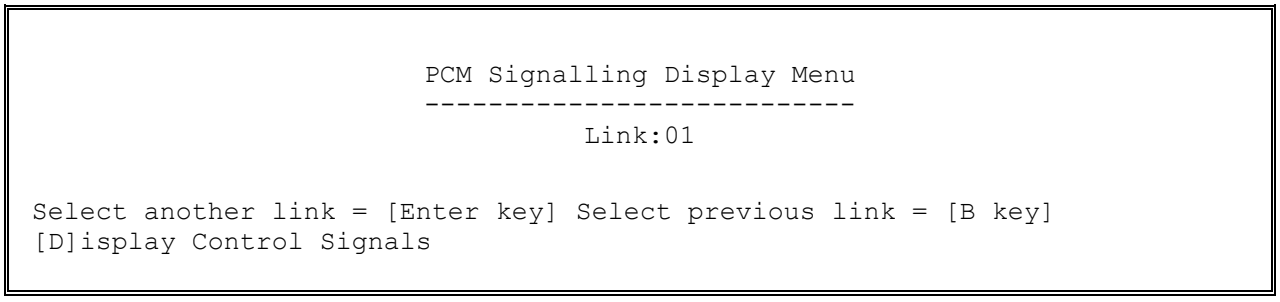

Figure 4-17. PCM Signalling Display Menu

1. From the PCM Signalling Display Menu, press **<Enter>** to toggle to the link number you want to view.
2. Press **D**, and the following menu appears displaying the selected link:

```
Link:1                  PCM Signalling Display Menu
DSO     To Link     To Bus          DSO     To Link     To Bus
-------------------------------------------------------------------
01      A_C_        A_C_            13      A_C_         A_C_
02      A_CD        A_CD            14      A_CD         A_CD
03      AB__        AB__            15      AB__         AB__
04      AB_D        AB_D            16      AB_D         AB_D
05      ABC_        ABC_            17      Data         Data
06      ABCD        ABCD            18      Data         Data
07      ___D        ___D            19      N/A          N/A
08      __C_        __C_            20      N/A          N/A
09      _CD_        _CD_            21      N/A          N/A
10      _B__        _B__            22      N/A          N/A
11      _B_D        _B_D            23      N/A          N/A
12      _BC_        _BC_            24      N/A          N/A
```

Figure 4-18. PCM Signalling Display Menu (T1 Example)

```
Link:8                  PCM Signalling Display Menu
Chls    To Link     To Bus          Chls    To Link     To Bus
-------------------------------------------------------------------
FRAME
01       A_C_       A_C_            16      A_CD        A_CD
02       A_CD       A_CD            17      AB_D        AB_D
03       AB__       AB__            18      ABCD        ABCD
04       AB_D       AB_D            19      A_CD        A_CD
05       ABCD       ABCD            20      AB_D        AB_D
06       ___D       ___D            21      _B_D        _B_D
07       __C_       __C_            22      ___D        ___D
08       _CD_       _CD_            23      ABCD        ABCD
09       _B_D       _B_D            24      A_C_        A_C_
10       _BC_       _BC_            25      AB_D        AB_D
11       _CD_       _CD_            26      ___D        ___D
12       ___D       ___D            27      N/A         N/A
13       _CD_       _CD_            28      N/A         N/A
14       A_CD       A_CD            29      ABCD        ABCD
15       ___D       ___D            30      _B_D        _B_D
CAS      N/A        N/A
```

Figure 4-19. PCM Signalling Display Menu (E1 Example)

The *PCM Signaling Display Menu* is a read-only screen that displays the control signals for a selected link. It will vary slightly depending upon which type of link is being viewed (T1 or E1). This screen will automatically refresh every 5 seconds. The information displayed in each field on the screen is detailed in *Table 4-13*.

Table 4-13. PCM Signalling Display Menu Field Descriptions

Field	Description
Link: (display field)	Displays the link number for which the control signals are shown.
DS0: (T1 display field)	Displays the time slot (DS0) for which the control signals are being reported.
Chls: (E1 display field)	Displays the channel for which the control signals are being reported.
To Link: (display field)	Displays the status of signalling towards the link. *N/A* indicates that the timeslot has not been mapped, or that it is a signaling or framing channel such as E1 CAS. *Data* indicates that the timeslot is being used to pass data. Voice traffic is indicated by the display of signalling bits in an *ABCD* format, depending upon application. A letter (A, B, C, or D) indicates a logic "high" or one, while an underscore indicates a logic "low" or zero.
To Bus: (display field)	Displays the PCM signaling bit status (per ATT Technical Reference 43801) in the direction of the DXC-100 backplane. *N/A* indicates that the timeslot has not been mapped. *Data* indicates that the timeslot is being used to pass data. Voice traffic is indicated by the display of signaling bits in an *ABCD* format, depending upon application. A letter (A, B, C, or D) indicates a logic "high" or one, while an underscore indicates a logic "low" or zero.

4.8 Utilities Menu

The Utilities Menu provides access to three submenus from which you can perform a *Cold Reset*, a *Warm Reset*, or change the module's status to *In Service* or *Out of Service*.

Navigation:
D8E1T1 Main Menu ↓ Utilities

```
                Utilities Menu
               ----------------

          Cold Reset Device

          Warm Reset Device
          Board Status: In Service
```

Figure 4-20. Utilities Menu

Caution A Cold Reset takes approximately 30 seconds and a Warm Reset takes approximately 15 seconds. Both will cause data to be briefly interrupted; use a Warm Reset for minimum interruption.

Table 4-14. Utilities Menu Option Table

Option	Description
Cold Reset Device	The *Cold Reset Device* utility resets the entire D8E1T1 module including resetting the framers and downloading the Xilinx software, and causes the D8E1T1 module to initialize to its power-up configuration. During this boot-up cycle, no user data will flow for about 30 seconds. Since the configuration resides on the System Manager Controller, connections will be restored.
Warm Reset Device	The *Warm Reset Device* utility causes the D8E1T1 module to initialize to its power- up configuration. A Warm Reset takes approximately 15 seconds, and does not reset framers or download Xilinx software. During this boot-up cycle, no user data will flow. Since the configuration resides on the System Manager Controller, connections will be restored.
Board Status	The *Board Status* utility allows the administrator to put the D8E1T1 module *In Service* or *Out of Service*.

Cold Reset Device

The Cold Reset Device utility is used to reset the entire D8E1T1 module including resetting the framers and downloading the Xilinx software. It causes the D8E1T1 module to initialize to its power-up configuration, and during this boot-up cycle, no user data will flow. Since the module configuration resides on the DSMC.2, all connections will be restored.

Navigation:
D8E1T1 Main Menu ↓ Utilities ↓ Cold Reset Device

Caution A Cold Reset takes approximately 30 seconds, and causes data to be briefly interrupted; if possible use a Warm Reset for less interruption.

1. Once *Cold Reset Device* has been selected, the following prompt appears:

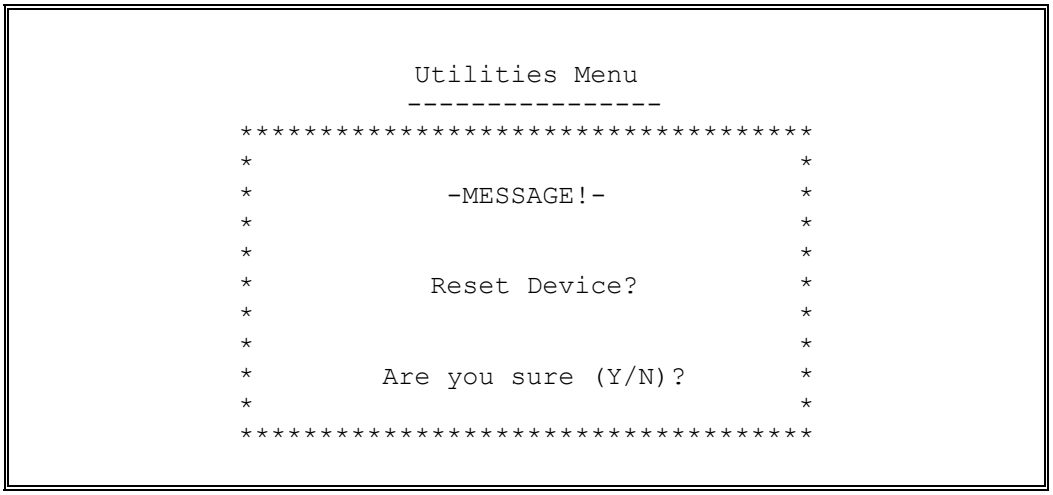

Figure 4-21. Cold Reset Device Prompt

2. Press **Y** to reset the board, and wait for the module to reset. This will take approximately 30 seconds for a Cold Reset, after which you will be returned to the Nest Summary Menu and the Device State will be displayed as *Online*.

Note *Once you have been returned to the Nest Summary Menu, the D8E1T1 module's state will cycle through a combination of Standby, Out of Service, and Online. This is a normal occurrence when the device resets. Wait for the Device State on the menu to display Online before you proceed.*

Warm Reset Device

The Warm Reset Device utility is also used to reset the D8E1T1 module, but it does not reset framers or download Xilinx software. It causes the D8E1T1 module to initialize to its power-up configuration, and during this boot-up cycle, no user data will flow. Since the module configuration resides on the DSMC.2, all connections will be restored.

Navigation:
D8E1T1 Main Menu ↓ Utilities ↓ Warm Reset Device

Caution A Warm Reset takes approximately 15 seconds, and causes data to be briefly interrupted.

1. Once Warm Reset Device has been selected, the following prompt appears:

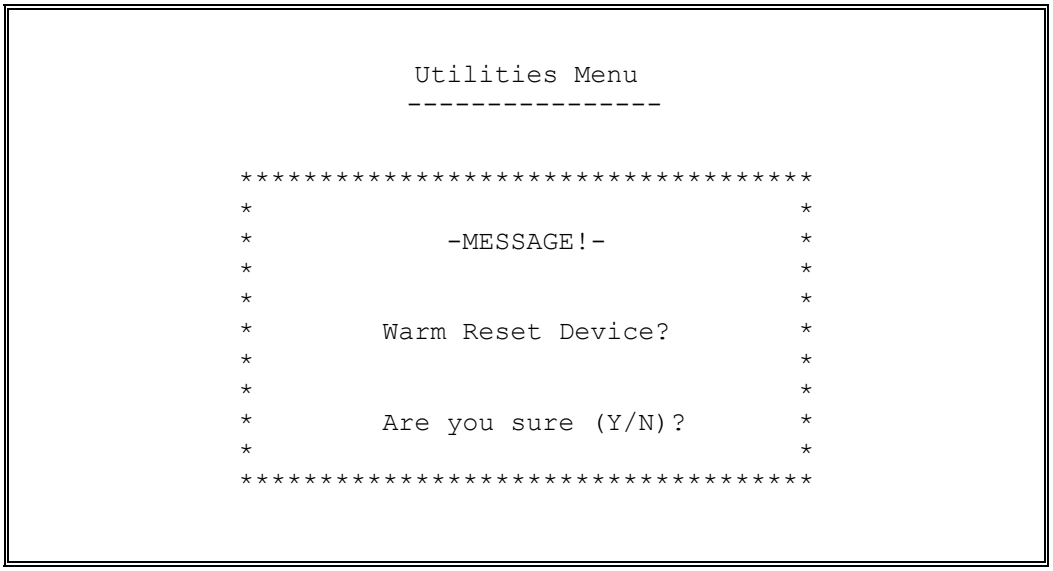

Figure 4-22. Warm Reset Device Prompt

2. Press **Y** to reset the board, and wait for the module to reset. This will take approximately 15 seconds for a Warm Reset, after which you will be returned to the Nest Summary Menu and the Device State will be displayed as *Online*.

Note *Once you have been returned to the Nest Summary Menu, the D8E1T1 module's state will cycle through a combination of Standby, Out of Service, and Online. This is a normal occurrence when the device resets. Wait for the Device State on the menu to display Online before you proceed.*

Board Status

The *Board Status* option allows the Administrator to put a device *In Service* or *Out of Service*.

Note *If a module is set to Out of Service, you cannot enter the Diagnostics Menu.*

Navigation:
D8E1T1 Main Menu ↓ Utilities ↓ Board Status

If the board status was *In Service*, the following prompt appears:

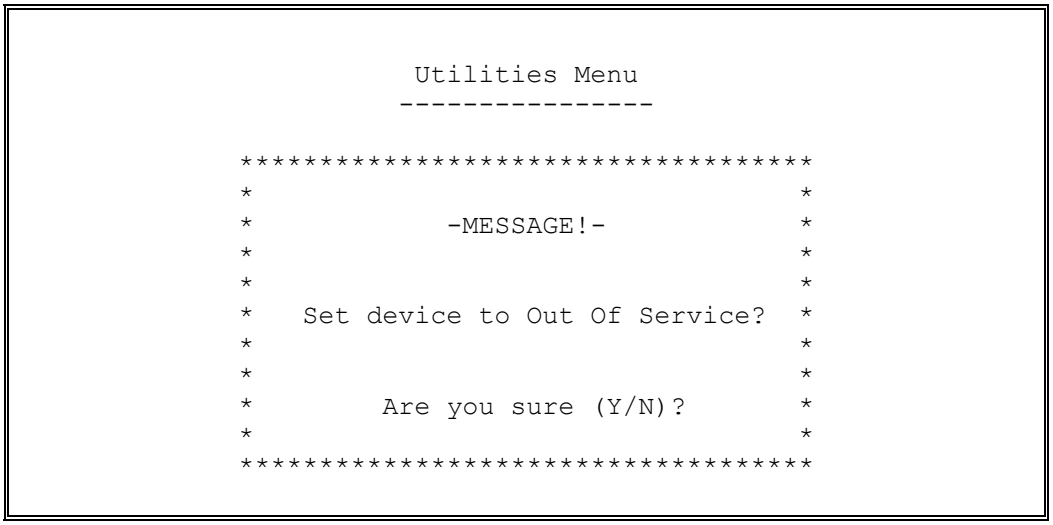

Figure 4-23. Board Status Screen (IS to OOS)

Press **Y**. The board is set to *Out of Service*, and you are returned to the Utilities Menu. Press **N**, and you are returned to the Utilities Menu.

If the board status was *Out of Service*, the following prompt appears:

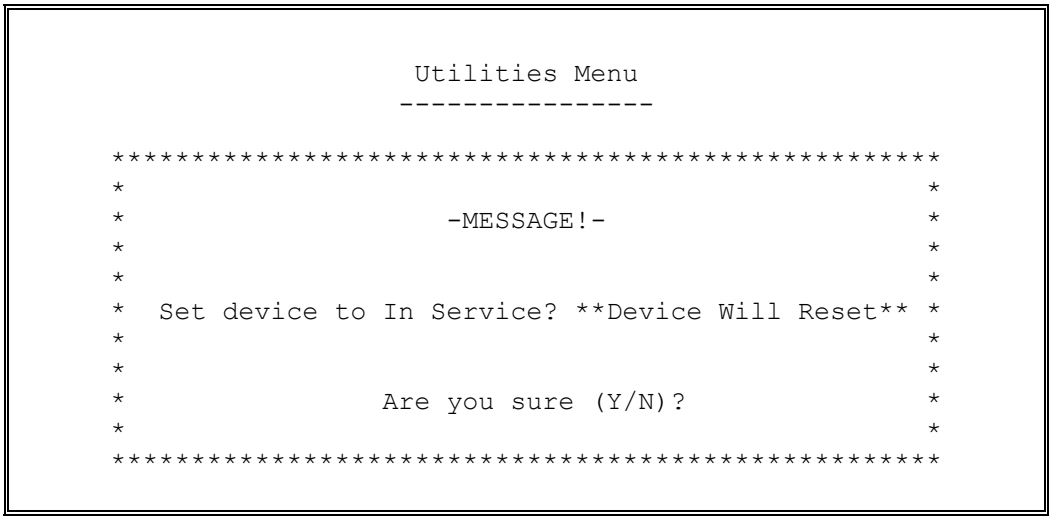

Figure 4-24. Board Status Screen (OOS to IS)

Press **Y**. The module will be reset, the board will be set to *In Service*, and you are returned to the Nest Summary Menu. Press **N**, and you are returned to the Utilities Menu.

Note *It can take up to 20 seconds for the Board Status to change to In Service. Once you have been returned to the Slot Summary Menu, the D8E1T1 module's state may cycle through a combination of Online, Standby, Out of Service, and finally Online. This is a normal occurrence when the device resets. Wait for the Device State on the Slot Summary Menu to display Online before you proceed.*

4.9 About Display

The About Display displays version, release date, and checksum information for the Octal T1/E1 Module software, and version information for the D8E1T1 module hardware.

Navigation:
D8E1T1 Main Menu ↓ About

```
                    About
                    -------
          Version..........: 7.3
     Release Date.....: October 31, 2002
     Checksum.........: 7AFC
     Xilinx Version...: t1e1_r11
     Front Card Type..: Octal T1/E1
     Front Card Rev...: 0
     Rear Card Type...: Octal T1E1 120 OHM
     Rear Card Rev....: 1
```

Figure 4-25. About Display

The About Display is a read-only screen. Descriptions for each field on this screen are supplied in *Table 4-15*.

Table 4-15. About Field Descriptions

Field	Description
Version: (display field)	Displays the software version currently residing in the D8E1T1 module's flash memory.
Release Date: (display field)	Displays the date of module software release.
Checksum: (display field)	Displays the sum of all bytes in the D8E1T1 module's flash memory at power up. Also used to identify software version.
Xilinx Version: (display field)	Displays the hardware version of downloadable, programmable devices.
Front Card Type: (display field)	Displays the type of Application Module in the system.
Front Card Rev: (display field)	Displays the Application Module's hardware revision level.
Rear Card Type: (display field)	Displays the type of Interface Module in the system.
Rear Card Rev: (display field)	Displays the Interface Module's hardware revision level.

4.10 Technical Support

Technical support for this product can be obtained from the local distributor from whom it was purchased.

For further information, please contact the RAD distributor nearest you or one of RAD's offices worldwide. This information can be found at www.rad.com (offices – About RAD > Worldwide Offices; distributors – Where to Buy > End Users).

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Customer Response Form

RAD Data Communications would like your help in improving its product documentation. Please complete and return this form by mail or by fax or send us an e-mail with your comments.

Thank you for your assistance!

Manual Name: D8E1T1

Publication Number: 371-205-05/05

Please grade the manual according to the following factors:

	Excellent	*Good*	*Fair*	*Poor*	*Very Poor*
Installation instructions	❒	❒	❒	❒	❒
Operating instructions	❒	❒	❒	❒	❒
Manual organization	❒	❒	❒	❒	❒
Illustrations	❒	❒	❒	❒	❒
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What did you like about the manual?

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Error Report

Type of Error(s) or Problem(s):

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